30675

RBB
28aa

COMMISSIONER OF PUBLIC HEALTH

WESTERN AUSTRALIA

THE ROYAL SOCIETY
for the Promotion
OF HEALTH
LIBRARY

REPORT

FOR THE YEAR 1964

By Authority: ALEX B. DAVIES, Government Printer

RBB/28 (aa)

22501397235

REPORT

OF THE

Commissioner of Public Health

for the year 1964

Presented to both Houses of Parliament

27105/5/66—700

WELLCOME INSTITUTE
LIBRARY
Coll.
Call
No.

The Honourable Ross Hutchinson, D.F.C., M.L.A.,
MINISTER FOR HEALTH

☆

Sir,

I have the honour to submit the Report of the Department of Public Health for the Year 1964.

WILLIAM SHARP DAVIDSON, M.B., Ch.B., D.P.H.,
Commissioner of Public Health.

CONTENTS

☆

Page
Report by the Commissioner of Public Health, Dr. W. S. Davidson 7

Supplementary Reports—

Appendix
I—Vital Statistics 11
II—Report by Dr. W. Laurie, Director, Public Health Laboratories 12
III—Report by Director of Tuberculosis Control Branch, Dr. F. G. B. Edwards 29
IV—Report by the Senior Medical Officer of the Epidemiology and Special Services 37
V—Report by Senior Medical Officer Child Health Services, Dr. R. Edmonds 44
VI—School Medical Report 54
VII—Report of the Senior Dental Officer, Mr. E. J. Turnbull 55
VIII—Report by Principal Matron, Miss P. F. Lee 56
IX—Nurses' Registration Board 58
X—Report on Occupational Health, Dr. D. Letham 60
XI—Report on Technical Information Service and Library by Dr. J. F. Woolcott 63
XII—Report of Physics Branch, State X-Ray Laboratory, by Mr. B. E. King 65
XIII—Report of Maternal Mortality Committee by Professor Gordon King (Chairman) 67
XIV—Report on General Sanitation by Senior Inspector, Mr. A. A. Pilbeam 70
XV—Report on Public Buildings by Senior Inspector, Mr. R. R. Dunstan 76
XVI—Morbidity Statistics for 1964—Metropolitan General Hospitals 77
XVII—Leprosarium—Admissions and Discharges 84
XVIII—Incidence and Mortality of Notifiable Diseases 85
XIX—Maternal Mortality—Cases of Maternal Deaths 1946–1964 86
XX—Stillbirth and Infant Mortality Rates 87
XXI—Stillbirth and Birth Rates 88
XXII—Meat Inspection 89
XXIII—Revenue and Expenditure 90

ANNUAL REPORT, 1964

☆

The Hon. the Minister for Health.

I have the honour to submit the report of the Department of Public Health for the year 1964.

VITAL STATISTICS

The population in 1964 rose to 790,224, an increase of 2.2%. The Birth Rate fell to 21.11 per 1,000 of the mean population ; the lowest figure since 1942. The Death Rate of 8.14 is slightly above that for the previous two years but is below that recorded for other States.

Maternal Mortality Rate per 1,000 live births was 0.36.

Infant Mortality at 19.66 per 1,000 live births is the lowest so far recorded in Western Australia, but is still higher than in several other States.

LEGISLATION 1964

The year 1964 was notable for the importance of legislation passed in the field of public health. The statutes are briefly described hereunder :—

Cancer Council of Western Australia Act Amendment Act, 1964

Several amendments were made mostly of a machinery nature. The procedure for the election of the President of the Council was clarified. The powers of the Cancer Council in relation to the functions of Cancer Institutes were more clearly defined. Previously the Council had been required to lodge its funds with the State Treasury. The amendment authorised the Council to operate through a bank.

Chiropractors Act, 1964

Following the Royal Commission into the Natural Therapists Bill, which was a private member's Bill, certain recommendations were made including the suggestion that legislation should provide for the registration of Chiropractors. Legislation in force in other countries was studied and in consultation with Western Australian practitioners a Bill was drafted. This was passed by Parliament substantially in the form submitted. The Act creates a Registration Board of five members. The Chairman is required to be a legal practitioner. Two members are to be chiropractors nominated by the Australian Chiropractors' Association. The remaining two are persons nominated by the Minister, one of whom shall be a person engaged in the practice of chiropractic. The Bill creates the Board an autonomous body, subject to the Minister. All normal powers to regulate professional standards, registration and the discipline of the profession are included in the Act.

Clean Air Act, 1964

This Act set up a thirteen-member Air Pollution Control Council with wide powers to regulate industry to prevent or minimise air pollution. The Act has a schedule of industries which require licences from the Council. A further division of the Act gives the Council power to regulate industries which are not mentioned in the schedule, if these industries in fact cause air pollution.

The Council draws its membership from several expert government agencies, together with representatives of industry.

Health Act Amendment Act, 1964

Previously the Act had dealt with boarding houses and lodging houses separately. A new definition of lodging house was inserted which embraced both classes of establishments. Local authorities were authorised to provided essential sanitary fixtures in any case where they undertook the connection of a house to a sewer. The limitation of 10s. which applied to the annual licence fee for a private hospital was removed. The Commissioner was empowered to prohibit the sale, distribution, use or advertising of any appliance, apparatus, equipment, contrivance, article or other thing if the article was intended to protect, safeguard, maintain or aid the health of any person and was found to be ineffectual, unsafe or useless.

Pharmacy Act, 1964 *and Poisons Act,* 1964

Prior to the passage of this new legislation the practice of pharmacy and the control of poisons were regulated under the Pharmacy and Poisons Act. This Act was administered by the Pharmaceutical Council. The two main functions of that Act are now divided under the Pharmacy Act and the Poisons Act. The administration of the Pharmacy Act remains with the Pharmaceutical Council, but the Poisons Act is entrusted to the Department of Public Health.

The opportunity was taken to modernise the Pharmacy Act and to correct a number of deficiencies in the repealed legislation.

The Poisons Act is based upon the recommendations of the National Health and Medical Research Council which proposed the grouping of poisons into eight schedules. There is a difference in the Western Australian legislation in that the fifth schedule is devoted to substances in the lesser toxicity range — these substances are referred to as " hazardous substances " instead of " poisons." The Poisons Act is administered with the assistance of an Advisory Committee comprised of experts drawn from within and outside the Public Health Service.

Police Act Amendment Act, 1964

The Police Department had previously exercised all powers over the legal and illicit supply or dealing in narcotics. The Poisons Act, through the operation of the eighth schedule and special provisions written into the Act provides for all lawful dealing in narcotics. The Police Act was therefore amended so as to recognise this fact but to make clear that the power to deal with unlawful dealing in narcotics remained with the Police Department.

Radioactive Substances Act Amendment Act, 1964

Two principal amendments were made to this Act. Under the old legislation the Commissioner of Public Health was Chairman of the Radiological Advisory Council. The Commissioner is now authorised to nominate a medical practitioner employed in the Department of Public Health to function as Chairman.

The previous legislation required medical practitioners and dentists to register any irradiating apparatus which they possessed. All other persons required a licence. The Council had little control over the safety measures to be adopted by medical practitioners and dentists. The powers of the Council in this direction were strengthened.

PUBLIC HEALTH LABORATORIES

The work of the laboratories continues to increase in quantity and variety. Extra accommodation has had to be obtained, as emergency measures, in prefabricated huts or caravans.

Three branch laboratories in the North and North-West were started in 1964. At Port Hedland accommodation had already been arranged when the new hospital was planned. At Carnarvon, however, a prefabricated building assembled in Perth was set up in the hospital grounds and for Wyndham a caravan unit was moved up from Perth.

Dr. Laurie again stresses difficulties arising from staff shortages and recommends a shortened course of full-time training for laboratory technologists instead of the present 5 year apprenticeship type of training.

TUBERCULOSIS

There were 20 deaths from tuberculosis in 1964 or 2.5 per 100,000 population. There were 208 notifications of new cases or 22.3 per 100,000 of population.

Atypical mycobacteria were the cause of infection in 2–3 cases per 100,000 and were responsible for 2 of the 20 deaths.

It is interesting to note that over 20% of the notifications of new cases comes from Mass Compulsory Surveys by x-rays. Cases are, however, getting fewer ; particularly in the lower age groups and in consequence it is the Department's policy to reduce progressively the number of surveys and to increase the minimum age of persons compulsorily x-rayed.

There has been a remarkable reduction in the number of cases of tuberculosis notified among miners. It is to be hoped that this improvement continues. The notifications of silicosis and asbestosis, however, are a matter of some concern and shall receive the attention of Dr. McNulty who has recently returned from overseas from a study of the pneumoconiosis.

EPIDEMIOLOGY

There were no major outbreaks of infectious disease. Infantile diarrhoea with 23 recorded deaths is however still a major problem to be overcome. No cases of Poliomyelitis were notified for the year. Salk vaccination was continued and increased to four doses.

The rapid increase in the number of cases of venereal disease was not maintained during 1964 but the teenage group was still prominent in the notifications (26%).

CHILD HEALTH SERVICES

Dr. Edmonds, in taking over the Infant and Pre-School Health Services on the retirement of Dr. Gibson, has first concerned himself with making a thorough investigation of his department to see what it did and what it consisted of.

He reports the result of his investigation in a manner which gives a full and authoritative description of his department and its activities.

He brings up the problem of the native child, the difficulties in caring for him and high rate of illness in native children. He also brings to our attention the disproportionate and excessive number of deaths from infection and accident in infants and young children in country areas and suggests that one factor influencing this is the difficulty in applying the various measures of preventive medicine in small populations spread sparsely over large areas.

There are, of course, other reasons of varying importance but the very interesting data submitted by Dr. Edmonds certainly calls for further work in the elucidation of the disparity between metropolitan and country deaths in the young.

The School Medical Service examined 48,441 children and recommended parents to seek medical advice for 4,442, i.e. 1 in 11 children required further medical attention.

The School Dental Service examined 9,669 children and treated 6,861. 2,119 required no treatment.

OCCUPATIONAL HEALTH

The staff of this section was increased at the end of the year by the appointment of Dr. H. H. Macey as Engineer, Air Pollution Control.

Dr. Macey is a scientist with high academic qualifications and extensive experience in industry and fuel technology. His appointment was a necessary corollary to the passing of the Clean Air Act and indicates a stage of development in the State of Western Australia wherein the increasing rate of industrial expansion requires that controls must be applied as a protection against air pollution both today and in the future.

Dr. Letham's report indicates the particular fields in which the Occupational Health Section was particularly active.

MATERNAL MORTALITY COMMITTEE

Seven cases of maternal death associated with childbirth were reported in 1964 and investigated by the Committee. One was a non-obstetrical death and of the remaining six, four in the opinion of the Committee could have been avoided.

Professor King reviews the work of the Committee during its four years of activity and indicates its value in improving medical teaching and care of the mother in childbirth.

FOOD AND DRUG ADVISORY COMMITTEE

The Committee met four times during the year and approved the adoption of the following regulations recommended by the Food Standards Committee of the National Health and Medical Research Council.

Type size in labelling,
Fish marinades,
Coconut,
Meat pies,
Pickles,
Cheese,
Soft drinks,
Diabetic, special diet and invalids foods.

Other draft regulations examined were—

Jams, conserves and marmalade,
Dried Milk,
Butter and butter products,
Cream and cream products.

Food additives approved were—

Ascorbic acid as a bread improver,
Benzoic acid as a preservative in fish marinades,
Diacetic and propylene glycol as solvents in essences,
Sulphur dioxide as a preservative in whole peeled potatoes.

The use of dyes in skinless frankfurts was not approved.

PESTICIDE ADVISORY COMMITTEE

Six meetings of the Pesticide Advisory Committee were held during the year. One hundred and forty nine applications for the registration of new pesticide products were examined ; eleven of these were refused because the labelling or formulation was unsatisfactory. Three applications were refused because the products were considered to be too toxic for general use by the public. The total number of registered pesticides at 30th December, 1964, was 1,084.

Among other matters concerning the safe use of pesticides dealt with during the year were—

Pesticide residues in food,
Proposals for the licensing of pest control operators,
The sale of sodium fluoroacetate treated (one shot) oats ; and,
The limitations of the concentration of warfarin used in rat tracking powders.

HOSPITAL MORBIDITY STATISTICS

Morbidity Statistics now include King Edward Memorial Hospital and Sir Charles Gairdner Hospital, thus extending the statistics to cover all five teaching hospitals. As King Edward Memorial Hospital is a Women's Hospital and Sir Charles Gairdner Hospital has no casualty department, and also includes long stay tuberculosis cases, the tables show some expected changes on previous years.

There is, for example, a considerable increase in women of the 20-29 age group in hospital because of the inclusion of maternity cases and the proportion of accident case occupied beds has dropped because of the inclusion of the two " non-accident " hospitals.

In spite of the changes incorporated in this year's tables the average length of stay in hospital remains more or less the same 13.06 days.

16.53% of all beds are occupied by accident cases with motor vehicle traffic accidents and accidental falls being the main and almost equal contributors.

Patients sixty years of age and over occupied 38.8% of all teaching hospital beds and children under the age of fifteen occupied 11.9%.

W. S. DAVIDSON,

6th May, 1966.

Commissioner of Public Health.

Appendix I

VITAL STATISTICS FOR WESTERN AUSTRALIA

	1962	1963	1964
Mean Population—			
Males	384,414	392,965	401,246
Females	370,845	380,270	388,978
Total	755,259	773,235	790,224
Births—			
Males	8,824	8,869	8,570
Females	8,240	8,421	8,115
Total	17,064	17,290	16,685
Birth rate per 1,000 of Mean Population	22·59	22·36	21·11
Deaths—			
Males	3,397	3,444	3,738
Females	2,413	2,532	2,691
Total	5,810	5,976	6,429
Death rate per 1,000 of Mean Population	7·69	7·73	8·14
Natural increase rate per 1,000 of Mean Population	14·90	14·63	12·98
Infant Mortality per 1,000—			
Live Births :			
Metropolitan Area	20·15	17·11	15·76
Rest of State	24·57	23·95	23·83
Whole of State	22·27	20·42	19·66
Stillbirths :			
Metropolitan	111	90	81
Whole State	203	178	170
Stillbirth rate per 1,000 total births	11·8	10·2	10·1

Comparison of Infant Mortality and General Death Rate

Place	Infant Mortality			General Death Rate		
	1962	1963	1964	1962	1963	1964
New Zealand (*a*)	20·44	19·62	19·1	8·87	8·81	8·8
Western Australia	22·27	20·42	19·7	7·69	7·73	8·1
New South Wales	21·36	19·90	20·3	9·26	9·19	9·6
Victoria	18·50	18·92	16·9	8·64	8·81	8·8
Queensland	21·13	20·09	19·2	8·56	8·50	9·2
South Australia	19·15	18·67	19·0	8·32	8·13	8·6
Tasmania	20·69	17·94	20·1	7·99	7·74	8·6

(*a*) Includes Maoris.

Appendix II

PUBLIC HEALTH LABORATORY SERVICE

ANNUAL REPORT, 1964

To the Commissioner of Public Health, Western Australia.

I.—ADMINISTRATION

General

The Service continues to function as a combined hospital-public health laboratory service : the title of the Service therefore is somewhat misleading.

Branch Laboratories

The provision of laboratory services in the North West continues. In March, 1964 a laboratory was opened in Port Hedland. This was followed by the provision of laboratory services at Carnarvon in August, 1964, and in the last week of December, 1964 a mobile laboratory began functioning in Wyndham.

The laboratories at Carnarvon and Wyndham are both housed in air-conditioned caravan-type structures. Increasing use is being made of such units which can be supplied within three weeks after the order compared with the many months required for the building of laboratories.

Accommodation

Accommodation, or rather the lack of accommodation, is much the most pressing problem in the Central Laboratories. Some help was obtained by the purchasing of the two caravan units of the type mentioned above. One of these is in use as a histopathology laboratory and the other as a sterilizing and packing department. These caravans provide only a very limited amount of help and the need for a large new laboratory is most urgent.

Tours and Conferences

The work of Dr. Kovacs continues to receive international recognition. He has been elected as one of the four-man Commission on tuberculosis in animals, by the International Union Against Tuberculosis, and in June he visited Prague to take part in the International Seminar on Mycobacteria. During 1964, he isolated a third new species of Salmonella in Western Australia and has proposed the name, Salmonella kimberley, for the species. Dr. Kovacs was due to retire in October, 1964 but kindly agreed to continue serving.

In January, 1964, Dr. Joy Hobday attended the A.N.Z.A.A.S. conference in Canberra and took the opportunity of visiting the more important virology centres in the Eastern States. During 1964, by examination, Dr. Hobday became a member of the College of Pathologists of Australia.

In April, 1964, Mr. Drummond, the Principal Technologist, was one of a group of Western Australian officials who moved into the dead heart of Australia to meet a team from Darwin and to carry out various tests and examinations on some of the rapidly dwindling groups of aborigines still living their own way of life with practically no contact with the white man. In all it was possible to investigate 61 such individuals as well as 37 with mission association. A brief review of the results is given in the Department of Serology report, see below.

During 1964, Mr. Barton, Senior Technologist of the Bacteriology and Microbiology Departments spent six months working in various centres in Britain, and Mr. Neal, Senior Technologist of the Haematology Department spent a similar period working in the Post Graduate Medical Centre, London. Such periods of refresher work, mostly in their own time and at their own expense, are of much value to the individual and to the Public Health Laboratories.

The flow of workers is not always in one direction. In 1964, we provided training for one physician from Fiji and one technologist from Borneo.

Working Hours

There has been no change in the method of working the laboratories, namely 14 hours daily seven days per week, with senior staff available on call during off-duty hours.

Character of Work

The work remains a combination of the general tasks dealt with in every hospital laboratory, together with the specialised work of a Public Health laboratory service. Police work has shown an especial increase due largely to the Public Health Laboratories undertaking relief work for the Police pathologist, Perth. In 1964, this represented 65 medico-legal post-mortem examinations, together with the resultant histopathology work and Court appearances. This Police work is additional to the considerable amount of Serological work carried out for the Police.

The general character of the work of the Public Health Laboratory Service is shown by its being registered as one of the two laboratories in Western Australia in which embryo pathologists can receive the full five-year course of training laid down as a qualifying period by the College of Pathologists of Australia.

The Problem of Increasing Demand

There is, as yet no change in the present system whereby all hospital investigations are dealt with directly by the laboratories without any screening-off of work in ward side rooms. This is the modern method and it has several disadvantages, one being a lack of training for medical students and general medical staff, and the other being that a significant proportion of laboratory results fall into the " normal " ranges.

Laboratory Costs

Despite a general rise in the cost of salaries, equipment, and material, it has been possible to keep down the cost per unit of work to the 1963 level. One of the factors contributing to this is the increasing use of automation in the laboratories.

STAFF CHANGES—1964

(including Branch Laboratories)

Position	Resignations	Recruited
Pathologist	....	2
Biochemist	....	1
Registrar	1	...
Senior Technologist	...	1
Technologist	5	9
Laboratory Assistants	3	4
Laboratory Attendants	16	24
Clerical	10	11

The table above summarises the staff changes in 1964. The recruitment of two senior pathologists and a biochemist eases the senior staff position slightly, though somewhat offset by the resignation of Dr. Topliss in December, 1964.

The major staff shortage is now in the technological section and the shortages are serious at all levels, from the trainee to the senior experienced worker. The shortage is especially serious in the mid-group, i.e., trained technologists. It is in this group that so many are lost by marriage and by resignation to proceed overseas on working holidays. During 1964, three of our trainee technologists completed their training and were promoted to technologists, but this number was offset by resignations. The present training scheme for technologists is a five years' course, almost wholly in evening classes. By this type of course we cannot hope to become self-sufficient in technologists in Western Australia. The only way of curing this chronic shortage is to make the course much the same as a university course, i.e., three year's training, all of which would be during the working day ; it is to be hoped that the Martin report on technical training will deal with this matter.

During 1964, it was with regret that we accepted the resignation of Mrs. Kellett who was for twelve years the Director's secretary.

Health Problems

In spite of the heavy exposure to pathogens and serious overcrowding and some overworking, the health of the staff was satisfactory in 1964. A total of 660 working days were lost through sickness in 1964, which represents 1.9% of the 34,720 workdays during the year. As in 1963, a few workers contributed a quite disproportionately large number of days lost, viz, four individuals lost 149 of the 660 days. Analysis of sickness by groups gives the following figures :—

Registrars, etc., who make up 4% of the workforce, account for 12% of lost days.
Senior Technologists ,, ,, 12% ,, ,, ,, ,, 6% ,,
Technologists ,, ,, 10% ,, ,, ,, ,, 3% ,,
Clerical ,, ,, 9% ,, ,, ,, ,, 9% ,,
Laboratory Attendants ,, 60% ,, ,, ,, ,, 70% ,,

Minor absenteeism has been less in 1964 than in 1963.

WORK DONE—1964

1. *General*

The work done in 1964 has been summarised in a series of tables placed at the end of this report, with the Central Laboratory work summarised in Table 1A and the work of the branch laboratories summarised in Table 1A and the work of the branch laboratories summarised in Table 1B. In the central laboratories there was a fall in microbiology and virology 1964 work compared with the work of the same department in 1963, but in all other departments the work increased in 1964 to give an over-all central laboratory increase for the year of 5% in the units of work done.

The branch laboratory summary shows the same tendency, i.e. the older laboratories are reaching a plateau of work with the younger laboratories showing a marked increase in work done in 1964 compared with work done in 1963. 1964 work as compared with that of 1963 shows an over-all increase of 39% in branch laboratories but a substantial proportion of this is accounted for by work done in new laboratories which were not functioning in 1963.

II MICROBIOLOGY

The work done in the Microbiology Department is summarised in Tables IIA (General, including Mycology), IIB (Tuberculosis Department) and IIC (Virology).

A. *General Microbiology.* Among points of interest are :—

1. *Growth media for the gonococcus.* This organism is difficult to grow and with the increase in the incidence of venereal disease over the last two years it was important to improve our methods. Previously we had used the Difco GC medium with Supplement A but now have also introduced and have obtained better results with Juhlin's Ascitic-fluid agar medium as described in Acta Pathologica 1963, vol. 58, page 51. At present both media are being used in parallel.

2. *Sensitivity testing.* Ampicillin was introduced into the routine sensitivity testing, and the results so far with Ampicillin 0.2 m.c.g. are shown in Table A herewith. It will be seen that the Enterococcus, Proteus strains and the majority of Staphyloccal and coliform strains were sensitive to this new chemotherapeutic agent.

   Table B shows the comparative sensitivity of Proteus mirabilis to 0.2 m.c.g. of Ampicillin and 10 units of Penicillin : it will be seen that the ampicillin is much superior to penicillin in killing this organism.

   Several of the gram negative bacteria were susceptible to the new Colimycin, and the sensitivity of Ps pyocyanea should be especially mentioned. These results compared with Polymyxin can be seen from Table C.

Table A

Organism	Ampicillin (0·2 m.c.g.)		
	Number of Strains Tested	Sensitive	
		Numbers	%
E. coli	887	579	65·3
Staph. aureus	281	200	71·0
Enterococcus	160	157	98·0
Pr. mirabilis	419	386	92·0
Pr. morgani	56	20	35·0
Pr. rettgeri	7	0	0
Pr. vulgaris	14	4	29·0
K. aerogenes	261	23	9·0
Aerobacter	15	5	33·0

Table B

SENSITIVITY OF PR. MIRABILIS (24 STRAINS)

Ampicillin 0·2 m.c.g.	Penicillin 10 units	Number	%
Sensitive	Sensitive	16	67
Sensitive	Resistant	5	21
Resistant	Sensitive	0	0
Resistant	Resistant	3	12

Table C

Organism	Colimycin			Polimyxin B		
	Number of Strains Tested	Sensitive		Number of Strains Tested	Sensitive	
		Number	%		Number	%
E. coli	776	768	99	864	820	94·6
Ps. pyocyanea	169	167	99	177	171	97·0
K. aerogenes	230	227	99	261	248	95·0
Aerobacter sp.	14	11	79	15	12	80·0

3. *Salmonella laboratory.* The detailed summary of work done can be seen from Tables D1 and D2.

Table D1

SHIGELLA ISOLATIONS, 1964

Shigella Strain	Number of Strains
Shigella sonnei	45
Shigella flexneri I	41
Shigella flexneri II	47
Shigella flexneri V	1
Shigella flexneri X	4
Shigella schmitzii	14
Shigella boydii	1
Total	153

Table D2

SALMONELLA SEROTYPES, 1964

Salmonella Serotype	Human Source			Other Sources				
	Cases	Faeces	Blood	Strains for Sero-typing	Sew-age	Mus-sels	Fish	Kan-garoo Meat
Salmonella typhi	....	....	....	2	....	....	....	....
Salmonella paratyphi B	....	....	....	1	....	....	....	....
Salmonella typhimurium	38	46	....	29	1	....	....	....
Salmonella muenchen	15	23	....	4	2	1	....	1
Salmonella adelaide	6	11	....	1	4	....	....	....
Salmonella tennessee	6	6	....	4	....	....	....	....
Salmonella saint paul	5	8	....	1	....	....	....	....
Salmonella chester	5	6	1	3	....	....	....	....
Salmonella onderstepoort	5	5	....	....	....	....	....	....
Salmonella wandsworth	4	4	....	1	....	....	....	....
Salmonella oranienburg	4	4	....	....	....	....	....	....
Salmonella orion	3	3	....	1	....	....	....	....
Salmonella wandsbek	3	3	....	2	....	....	....	....
Salmonella hvittingfoss	2	2	....	1	....	....	1	....
Salmonella welikada	3	3	....	....	....	....	....	....
Salmonella litchfield	2	2	....	1	....	....	....	....
Salmonella kimberley	2	2	....	....	....	....	....	....
Salmonella emmastad	2	2	....	....	....	....	....	....
Salmonella newington	2	2	....	....	....	....	....	....
Salmonella urbana	1	1	....	....	....	....	....	....
Salmonella abony	1	1	....	....	....	....	....	....
Salmonella zehlendorf	1	1	....	....	....	....	....	....
Salmonella senftenberg	1	1	....	....	1	....	....	....
Salmonella brisbane	1	1	....	....	....	....	....	....
Salmonella potsdam	1	1	....	....	....	....	....	....
Salmonella bredeney	1	1	....	....	....	....	....	....
Salmonella lexington	1	1	....	....	....	....	....	....
Salmonella anatum	....	....	....	1	....	1	....	....
Salmonella bovis	....	....	....	....	....	....	....	....
Salmonella morbificans	....	....	....	3	....	....	....	....
Salmonella give	....	....	....	2	....	....	....	....
Salmonella cholerae-suis	....	....	....	10	....	....	....	....
Salmonella poona	....	....	....	....	1	....	....	....
Salmonella derby	....	....	....	....	....	1	....	....
Salmonella (serotyping in progress)	....	....	....	1	3	....	....	....
Totals	115	140	1	68	12	3	1	1

A new Salmonella strain was isolated from a baby with diarrhoea and vomiting. This new serotype, S. kimberley, has the antigenic structure of 38 : 1, v : 1, 5 which was kindly defined by Dr. Joan Taylor, Director of the Salmonella Reference Laboratory in Colindale. This is the third new serotype isolated in our laboratories.

One of the more practical findings has been that it is not possible to rely on any routine treatment with sulpha drugs in the treating of Shigella infections. The choice of the proper drug is essential. Furoxone is most effective in laboratory testing but the clinical results are not always satisfactory. Results of sensitivity testing with these organisms against a series of drugs is shown in Table E which includes the greater part of our material since 1961. Attention is drawn to the results with the newer drugs, Ampicillin, Colimycin and Neomycin.

Table E

SENSITIVITY OF SHIGELLA TYPES 1961 TO 1964

Shigella Type	Number of Strains Tested	Streptomycin	Chlorotetracycline	Oxytetracycline	Tetracycline	Chloramphenicol	Neomycin	Furoxone	Sulphadiazine	Ampicillin	Colimycin
		%	%	%	%	%	%	%	%	%	%
Flexner I	100	21	45	41	38	24	95	97	14	93	75
flexner II	120	57	72	70	71	76	97	100	4	95	75
flexner III	1	....	....	....	....	....	100	100	....	100	....
flexner IV	1	....	100	100	100	100	100	100	....	....	....
flexner V	1	100	100	100	100	100	100	100	Nil	100	100
flexner VI	8	50	50	50	50	50	....	88	25	....	....
flexner X	3	Nil	Nil	Nil	Nil	Nil	100	100	Nil	100	....
flexner Y	2	100	100	100	100	100	100	100	Nil	....	....
sonnei	232	86	89	86	84	92	97	99	24	59	100
boydii I	1	100	100	100	Nil	100	100	100	Nil	Nil	100
boydii II	38	61	79	68	67	76	97	100	42	100	....
schmitzii	14	21	79	79	79	79	86	100	14	77	100
Totals	521	62	75	71	70	73	95	99	18	84	88

4. *Water and Sewerage Examination.* From several authorities queries have been received about the accuracy of the M.P.N. (Most Probable Number) method of estimating river and sewerage examinations. These tests were carried out with three 10-mls., three 1-ml., and three 0.1-ml. volumes of each of the three consecutive ten-times dilution of the specimens. To test the accuracy of this method the M.P.N. was done in triplicate from a number of specimens, i.e., for each dilution twenty seven tubes were used, i.e., for each of these control examinations 81 tubes were used per specimen. The difference between the upper and lower limits of the readings was less than 1 : 3, although according to international standards, the confidence limits may have a ratio of as much as from 1 : 10 to 1 : 15.

5. *Mycology.* The 1964 statistics do not indicate clearly the trend in demand for mycological investigations. Towards the end of 1963 we ceased the routine mycology investigation of sputa sent to the general laboratories for bacteriological examination. It is this which has caused the drop in the number of mycology specimens examined in 1964.

Requests for fungal examinations continue to increase. Two hundred more skin scrapings in the laboratory were carried out in 1964 as compared with 1963 ; the predominating pathogens still show the same pattern, e.g., Microsporum canis is almost exclusively the cause of ringworm infections in children in this State.

To differentiate between Trichophyton mentagrophytes and Tr. rubrum a new test has been introduced. This is an in-vitro hair-soil culture technique which has been made necessary due to the increasing number of atypical strains isolated. This is essential as the species identifications of these two fungi is important in treatment.

Two cases of Trichomycosis axillaris were noted for the first time.

An experiment was run to check a new " rapid " method for the identification of Dermatophytes recently reported from Queensland. So far this method seems to take longer than our present routine method but will be more fully investigated.

Candida infections continue to show a steady increase, especially vaginal infections. These infections do not seem to be confined to pregnancy and diabetes as was previously believed. This may be due to use of antibiotics for other conditions and it would be of interest if a survey could be conducted on this problem.

Sputum investigations are now very few, but it is of interest to know that in 1964 there were two very likely cases of Aspergellosis of the lung from the Gairdner Hospital, and from the Repatriation Hospital there was one confirmed case. Aspergellus had been isolated regularly from the sputum of this patient and after his death the lung specimens showed large masses of the fungus.

B. *Mycobacteria Laboratory.*

During 1964 there were 17,234 specimens from human material cultured for mycobacteria, and from these we recovered 875 M. tuberculosis, 40 M. bovis, 3 B.C.G. strains and 545 unclassified mycobacteria. The results of the unclassified mycobacteria examinations are shown in Table F together with a summary of the findings in previous years.

From animal material there were cultured 352 M. bovis strains with a total of nineteen unclassified mycobacteria also found. These nineteen mycobacteria were made up of nine group II strain, nine group III strain and one group IV strain. Of the nine of group III strain it was possible to identify three strains, all from Northern Territory buffaloes, which were identified as M. avium.

Table F

UNCLASSIFIED MYCOBACTERIA ISOLATED FROM 638 PERSONS (GROUP III : 478 PERSONS)

Specimen	1955–1956			1957–1958			1959–1960			1961		
	Group			Group			Group			Group		
	II	III	IV	II	III	IV	II	III	IV	II	III	IV
Sputum	....	...	18	3	13	2	24	341	14	21	388	31
Bronchial Lavage	....	....	....	....	....	....	....	12	1	...	....	1
Laryngeal Swabs	....	....	....	....	....	....	....	2	....	....	....	...
Gastric Contents	....	1	26	2	1	8	4	22	2	1	4	2
Pus	....	....	....	....	1	....	....	....	....	....	....	.
Urine	....	....	4	....	....	....	....	5	1	2	....	....
Resected Lung Tissue	....	....	....	....	....	....	....	3	....	....	2	....
Lung Tissue	....	....	....	....	....	....	....	8	....	....	7	....
Lymph Node Taken at P.M.	....	....	....	....	....	....	....	....	....	....	1	....
Bone Marrow	....	....	....	....	....	....	....	....	....	....	1	....
Faeces	....	....	....	....	....	....	....	1	....	....	...	....
Pleural Fluid	....	....	....	....	....	....	....	1	....	....	....	....
Gland	....	....	....	....	....	....	....	3	....	....	....	...
Seminal Fluid	....	....	....	....	....	....	....	....	....	....	1	....
Total	....	1	48	5	15	10	28	398	18	24	404	34
Grand Total			49			30			444			462

Specimen	1962				1963				1964				Total
	Group				Group				Group				
	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Sputum	5	12	311	17	8	28	347	12	9	68	426	13	2,111
Bronchial Lavage	....	....	1	2	....	....	....	....	....	4	3	....	24
Laryngeal Swabs	....	....	....	....	....	....	....	....	....	....	....	....	2
Gastric Contents	....	....	5	....	....	....	2	1	....	2	2	....	85
Pus	....	....	....	....	....	....	....	....	....	....	3	....	4
Urine	....	....	2	....	....	....	2	....	....	....	5	2	23
Resected Lung Tissue	....	....	1	....	....	....	2	....	....	....	1	....	9
Lung Tissue	....	....	11	....	....	....	2	....	....	....	3	....	31
Lymph Node Taken at P.M.	....	....	....	....	....	....	....	....	....	....	....	....	1
Bone Marrow	....	....	....	....	....	....	1	....	....	....	....	....	2
Faeces	....	....	....	....	....	....	4	....	....	....	2	....	7
Pleural Fluid	....	....	....	....	....	....	....	....	....	....	....	....	1
Gland	....	2	3	....	....	....	3	....	....	....	2	....	13
Seminal Fluid	....	....	....	....	....	....	....	....	....	....	....	....	1
Total	5	14	334	19	8	28	363	13	9	74	447	15	2,314
Grand Total				372				412				545	2,314 (Gr. III, 1962)

From material received from other States in Australia and from England 58 M. avian strains were isolated.

From a water survey(reservoirs, swimming pools, etc.) 58 group II strains (scotochromogenic) were isolated, and from a swimming pool one sensitive M. tuberculosis with low virulence was cultured.

There is no question but that the high numbers of isolations is very largely a matter of attention to detail. In our routine investigations six tubes of media were used for each specimen : these were two of Kirchner medium, two of Gerloff medium and two of blood medium. One tube of each of these was prepared without glycerol. In the culture of M. bovis both the Kirshner and the blood media without glycerol gave significantly better results than the Gerloff medium without glycerol. Glycerol concentrations as low as 0.1% interfere with the growth of bovine tubercle bacilli and growth was completely inhibited in specimens from animal organs. Our media without glycerol will allow good growth of M. tuberculosis yet the advantage of glycerol is evident in the cultures of unclassified mycobacteria. Battey bacilli and group II (scotochromogenic) strains show better growth in a glycerol medium than one without glycerol.

For examinations on the occurrence of mycobacteria in the environment of man, i.e., examinations of samples of dust, soil and milk, parallel cultures at 30°C were run in parallel with cultures at 37°C. Almost all the group II strains isolated from water were grown at 30°C only.

During 1964 no primary resistant strains of M. tuberculosis were found in specimens from newly-diagnosed phthisis patients. This result reflects credit on the staff of the Tuberculosis Control Branch and on the staff of the Gairdner Hospital.

It is felt that certain false-negative results obtained by workers everywhere are due to the harsh pre-treatment of the specimen and, to test this, parallel decontamination was carried out on a large number of sputum and urine specimens using (a) 4% NaOH and (b) acetylcysteine with 2% NaOH according to the method of Kubica and his workers, and later with modifications of this method. The use of the latter method for the homogenisation of sputum with the help of a vortex mixer is a simple method but a relatively high percentage of the specimens was lost owing to contamination. For a large number of these parallel investigations, apart from our routine we used Middlebrook's 7H10 medium in plate cultures and added a petri dish with M. phlei culture into the Mylar bags as suggested by Cohn and Middlebrook. The results were unsatisfactory.

Although in a number of specimens the use of 2% NaOH gave very good results, the Petroff method gave a higher yield. One reason for the failure of the former was the considerably increased contamination rate. Kubica emphasized that though his method did not kill all the contaminants, his good results were mainly obtained by using plates of 7H10 medium from which the mycobacteria could be picked.

In our experiment with 51 positive M. tuberculosis specimen cultures only 19 were positve with Middlebrook medium on Felsen plates used for primary sensitivity testing, with 28 negative and four contaminants. One limitation of the Middlebrook technique is most probably the short observation time. The advantage of the routine method in these laboratories is the use of several media represented in the six culture bottles. This " blanket " technique gives the mycobacteria a better chance to grow on their optimal medium and the multiplicity of tubes minimises the effect of contamination.

Besides the work with acetylcysteine we also tried two quarternary ammonium compounds as decontaminants, 228 specimens were tried with Desogen using Saxholm's method and 306 specimens were tried with Zepheran using Wayne's technique. Both of these methods have their limitations as they can be used only with egg-media such as the Lowenstein-Jensen medium or its modifications. The main reason for our failure was that traces of the quarternary ammonium compounds interfered with the growth of Kirshner and blood media in contrast to the egg media, the lipoid action of which neutralises the bacteriostatic action of the traces of the disinfectants, e.g., two capillary drops of inoculum gave better culture results than five drops in spite of the fact that the smaller inoculum contained fewer viable bacteria. However, the use of Asolectin to neutralise the quarternary compounds only partly improved our results.

We are still searching for a more selective decontaminant than the routinely-used alkalis such as NaOH or Na^3PO^4, or routinely-used acids such as HCl or H^2SO^4, etc. It is probable that these acids and alkalis as routinely used kill more than 80% of the viable organisms in the specimen.

In the *differentiation* of strains of mycobacteria, it was necessary to use culture at 23°C ; at 37°C ; the growth rate ; the colonial morphology ; pigment production in the dark and in the light ; cord formation ; and a battery of biochemical tests namely catalase-peroxidase, niacin, nitrate reduction and urease tests.

Bovine tuberculosis in the Northern Territory of Australia. During our investigations of specimens of of buffalo glands, cattle glands and pig glands sent from Darwin a high percentage of the specimens yielded bovine tuberculosis strains. Details of these and other mycobacteria are given in Table G herewith.

Table G

Infection due to M. bovis in the Northern Territory of Australia, including the occurrence of " unclassified " mycobacteria in animal glands (to 31st December, 1964).

ANIMAL	No. of glands	M. Bovis	%	Group II	%	Group III	%	Group IV	%
Cattle	125	107	85·6	2	1·6	....	....	....	....
Buffalo	134	102	77·1	5	3·7	4 (3)	2·9	1	0·7
Pig	87	31	28·1	12 (7)	13·5	10 (1)	11·5	1 (1)	1·1

Figures in brackets ( ) indicate the occurrence of M. bovis in the same gland.

The research on M. bovis in animals proved very profitable because in 1964, thanks to improved techniques and media, we found four new cases of bovine tuberculosis in man in Western Australia. Thus, Western Australia with less than 800,000 population, has recorded 14 cases of bovine-strain tuberculosis in man. This is probably the largest material from any one of the Australian States. It is possible also that in the past we may have missed several cases due to inadequate media and techniques.

C. *Virology Laboratory*

In 1964 the Virologist visited four weeks in the Eastern States to investigate new techniques. The results of culture on human foetal tissues was impressive and this method is being increasingly adopted in the larger centres in New South Wales and Victoria. Unfortunately it is difficult to obtain a supply of such tissues in Western Australia because the local hospitals and nursing homes have not yet become accustomed to the idea of supplying material. Some specimens have been received, however, and it is hoped that the supply will increase. The need for such types of tissues is well exampled by a case in 1964 of a patient who died of what might have been haemorrhagic smallpox. Scrapings made from a vesicle were histologically more suggestive of chicken pox than of smallpox but the diagnosis could not be confirmed as Varicella virus requires human fibroblasts before it will grow.

With the aid of these human tissues we hope eventually to cultivate the viruses of infectious hepatitis, common cold and a host of other viruses of medical importance. Monkey kidney tissue which we routinely import from the Commonwealth Serum Laboratories is only of limited use and is all too often contaminated with Simian virus.

Another impressive piece of work seen in the Eastern States was that of the Fairfield Hospital Laboratory in its regular collection and examination of specimens from a creche for infants and toddlers in the poorest part of Melbourne. The pattern of virus isolations from these children who are not noticeably ill parrallels that of the viruses grown from patients in the Infectious Diseases Hospital and is a sensitive index of the prevalent viruses in the community.

1. From the diagnostic work of the Virology Department in 1964 a few notes of interest have emerged. In January and February, 1964 there was an epidemic of severe gastro-enteritis among infants and toddlers in Broome and Derby. From these patients we isolated several strains of at least two varieties of Coxsackie A viruses, and in March-April, 1964 the same viruses appeared in faecal samples from children in Perth.
2. In the early winter months we isolated a few strains of para influenza and mumps from patients with laryngo-tracheitis and encephalitis.
3. In the late winter months the new variant of influenza reached Western Australia. This variant of influenza proved particularly difficult to cultivate and has only occasionally been isolated anywhere. Using the techniques devised by Dr. Warburton, the nearest W.H.O. consultant, we were able to isolate 13 strains. Nearly 50 cases were diagnosed serologically. Experience in the Eastern States has shown that past infection with the Asian strain and its variants offers some protection which may explain the absence of an epidemic in Perth, but Derby and Laverton were hit severely.

Perhaps the most noteworthy feature of the year is a negative one, namely infrequency of Coxsackie B virus infections. Only two strains of this group have been isolated in 1964 : both were B3 and both occurred in January, 1964. This lack of Coxsackie B infections in the community in 1964 has been confirmed by the results of serological tests on almost 500 specimens of sera sent to the laboratory for treatment of viral antibody content. In these 500 patients there were four specimens positive for Coxsackie B3. There were two specimens positive for Coxsackie B2 and one specimen each was positive for B4 and B5.

Leucocytes culture for the diagnosis of tuberculosis was stopped at the beginning of 1964 as this method was found to have no value in the diagnosis of tuberculosis.

Present investigations include ; plaque counting technique as an accurate measure of virus content ; improved staining methods for the differentiation of viruses ; and phase-contrast microscopy for better and earlier diagnosis.

The biggest single problem in the Virology Laboratory remains that of failure of clinicians adequately to utilise our resources. The problem of inadequate material, wrong type of material, and no follow-up bloods still prevent our being able to obtain a reasonably exact picture of viral infections in the State. During 1964 an opportunity was taken to discuss this problem with the College of General Practitioners, and arrangements were made for us to issue monthly notes in the Bulletin of the Western Australian Branch of the Australian Medical Association.

III—BIOCHEMISTRY

The work of the Biochemistry Department for the year 1964 is summarised in Table III, Appendix.

Output was 11% greater than in 1963. This increase was not so marked as that between 1962 and 1963, partly as a result of a decrease in numbers of specimens received from State organizations. An apparent inflation of the grand total under the heading " State " had resulted from the inclusion of a large number of blood collections under this heading. This item came mainly from the Gairdner Hospital in previous years.

The increased output came largely from investigations carried out for the Gairdner Hospital. An approximate calculation shows a 50% increase of tests carried out between 1963 and 1964. Inspection of tables for individual investigations shows that blood electrolytes represent a large proportion of the total requests made by the Hospital. It is felt that more detailed studies should be made on this aspect of laboratory service, such as the determination of blood pH. pCO2, etc. Serum enzyme levels form another large section. Apart from their importance in liver function tests, these are of importance in the dianosis and assessment of cardiac and other conditions. Again, more detailed investigations, such as the determination of isoenzymes, would be of value. Expansion along these lines would be difficult because of lack of space and shortage of technical personnel, but the possibility must be considered.

The general decrease in amount of State work carried out by the Central Laboratory presumably reflects the increasing capacity of the country laboratories to perform their own investigations. This, of course, results in an increase in the amount of reagents, etc., supplied to them by the Central Laboratory, and the issue of such materials continues to entail a considerable amount of work for Biochemistry - as in other Departments.

Toward the end of the year the polarograph and the gas chromatography equipment were transferred to a larger room, which had been adapted as a laboratory. Preliminary work had shown that the polarograph should be available for routine determinations of various metals, while the chromatograph will, in the first instance, be used for separations of urinary steroids. The particular instrument possessed by the laboratory (Pye-Argon), is not readily adaptable to the performance of a variety of investigations proceeding simultaneously in the laboratory. Modern apparatus is becoming increasingly versatile. Reasonable use of polarographic and gas chromatographic techniques presupposes continuing technical assistance to operate them. The laboratory in which they are housed is also being used for developmental studies on other aspects of biochemistry.

IV—HAEMATOLOGY DEPARTMENT

The work of the Haematology Department in 1964 is summarised in Table IV of the appendix. There has been an increase of 11% in 1964 as compared with 1963, i.e., a slowing down of the growth rate as compared with previous years, although it should be noted that the output of work has increased 100% in the last four years ; this marked increase is due to increasing demand by practioners and hospitals alike. The most marked of the increases has been in compatibility tests for blood transfusion; these tests doubled over the last two years due to the change in character of the hospital from a chest hospital to a general hospital.

Staff shortages are a problem in this as in other departments, particularly in the middle group, i.e., technologists. Since important work, such as blood transfusion checking, can only be carried out by qualified trained personnel, this means that the qualified staff, three in number, are each on duty for emergency work ten days monthly, sometimes working long hours during the " off-duty " hours ; this is a threat to health and efficiency.

During his working holiday overseas in 1964, the senior technologist investigated, among other things, the problem of increasing automation in haematology departments, since so many of the tests lend themselves to this type of processing. A limiting factor in automating the work is the lack of space in the laboratories and it is envisaged this will only change with the building of a new laboratory.

Hand-in-hand with increasing automation is the continuing search for new and better techniques. Among problems investigated during the year was the question of disposable specimen containers for prothrombin estimation and a method for standardising control of haemoglobin estimations.

V—SEROLOGY DEPARTMENT

Table V in the appendix gives a summary of the work done in the Serology Department for the year 1964. Although there was a drop in the total number of tests, there was an increase of almost 8% in the unit values due to an increase in 1964 of certain more complex tests ; much of the fall in tests was due to a fall in tests for Syphilis but with the increasing venereal disease rate, this is not likely to be repeated in 1965.

The most striking increase in numbers was in complement-fixation (C.F.) tests for hydatid disease and correlation with actual disease states appears to be improving ; the nature of this disease however, makes it difficult to prove or disprove the serological findings.

Among points of interest during the year, the following were noted :—

A. *Serology of Venereal Disease*

During 1964, the routine tests for treponemal serology have been ; the Wassermann Reaction ; Reiter Protein C.F. test ; and the Cardiolipin flocculation V.D.R.L. test. This was the battery recommended by Dr. Wilkinson of the Venereal Disease Reference Laboratory, Whitechapel Clinic, London. Dr. Wilkinson has also actually dealt with " problem " sera we have sent to him and we are much indebted for his assistance and advice.

It is interesting to compare the 1964 results with those obtained eight years ago (1956), selected for comparison because it was the first full year after we abandoned the crude heart extracts previously used for the Wassermann Reaction.

Number of Sera Tested :

	Found Positive	Found Negative	
1956	232	4,120	= 5.63% +ve
1964	329	5,930	= 5.55% +ve

These figures do not include Aborigine survey sera, routine sera submitted from the Maternity Hospital, or repeat sera from known positive patients.

B. *Serology of Toxoplasmosis*

After a promising start, using the Dye Test in parallel with the C.F. Test, we had to abandon the Dye Test for lack of a source of accessory factor. In place of the Dye Test we substituted the haemagglutination test and we are indebted to Dr. Ludlam of Leeds, England, for advice and assistance in this work. The exact evaluation of this new test is not yet finished. Of the sera submitted for testing, 125 were from outside Western Australia.

C. *Pregnancy Tests*

Towards the end of the year, we conducted U.C.G. Tests (Urinary Chorio-Gonadotrophin), in parrallel with toad tests. There was positive correlation in 121 tests and negative correlation in the remaining seven. Follow-up studies indicated that the results of the U.C.G. tests were correct with some of the toad-test results being misleading ; or, to use a better phrase, the U.C.G. test is more sensitive. The details of these cases are :—

Case	History	Original Toad Test Result	Original U.C.G. Result	Follow-up Findings
E	Threatened abortion	Neg.	Pos.	Later blood tests showed two toads negative.
C	? Pregnant	Neg.	Pos.	Ten days later, U.C.G. still positive. Friedman positive, Toad still negative.
H	Threatened abortion	Neg.	Pos.	Nil.
N	Menorrhagia	Neg.	Pos.	Friedman positive
R	Amenorrhoea	Neg.	Pos.	Nil.
Du 17/12	....	Equivocal x 2 Neg.	.... Pos.	Friedman positive.
Da	....	Neg.	Pos.	L.M.P., 16/11/64, urine received 30/12/64.

When the above trends became apparent, U.C.G. Pregnancy Test kits were issued to Branch Laboratories, with instructions that the kits should be used for urgent cases, with duplicate specimens being sent back to the Central Laboratories for confirmatory Toad Tests.

D. *Typhus*

This disease, once common in Western Australia is rarely detected in the Serology Laboratories nowadays. In February, 1964, however, a pair of sera from the Medical Officer at Christmas Island showed a diagnostic rise in titre to the C.F. test against R. mooseri antigen, and the Weil Felix test was also positive. In June, 1964, two sets of paired sera from two patients in the Albany district showed diagnostic rises in Weil Felix tests ; the patients were both from farms, well away from Albany town and about 100 miles apart. The patients apparently fell ill within a few days of each other and were attended by different doctors. The clinical notes given were (1) " P.U.O. 10 days ???? Psittacosis with fever splenomegaly, meningismus and arthritis " and (2) " P.U.O. with rash and vomiting." Later information was that one of the patients had complained of flea bites and the other patient said he had been cleaning out rat-infested oat bins.

E. *Influenza*

During the winter of 1964 complement fixation tests indicated the presence of Influenza, type A, from widely scattered areas in the state—Laverton, Geraldton, Bunbury, Perth, Derby and Kalgoorlie. After being tested in the central laboratories, the sera were forwarded to the Virus Reference Laboratory in Melbourne. We are indebted to Dr. P. Warburton of that Laboratory and also to Dr. Howarth of the Institute of Medical and Veterinary Research, Adelaide, for assistance and advice.

F. *Forensic Serology*

After the peak period of 1963, medico-legal work fortunately was lighter in the Serology Laboratory in 1964. There is sufficient volume and variety of work however to justify employment of one worker full-time. A separate room or section for this work is very desirable because of the nature of some of the materials handled.

G. *Serology of Aboriginal Australians*

We have for many years examined numbers of sera from natives from various parts of the State and noted their interesting treponemal serology.

This year the Principal Technologist, accompanied a medical officer of the Department on a five weeks' journey into the Central Desert, commencing on 1st April in Perth. This was in conjunction with an inspection party organised by the Department of Native Welfare and comprised as follows :—

Dr. J. J. Elphinstone, Medical Officer, Department of Public Health, W.A.
Mr. J. Harman, Superintendent, Department of Native Welfare, W.A.
Mr. J. Taylor, District Officer, Department of Native Welfare, W.A.
Mr. R. Tonkinson, Anthropologist, University of W.A.
Dr. P. Playford, Geologist, Geological Survey Branch, W.A.
Mr. A. F. Drummond, Medical Technologist, Department of Public Health, W.A.

This party, in three vehicles, met and travelled intermittently with two Commonwealth Patrol Officers, (Messrs. McDougall and Macaulay), based at Woomera, and a party led by Mr. J. Long of the Welfare Department, Darwin.

The facilities of Giles Meteorological Station and Warburton and Cosmo Newberry Missions were made available to us and were gratefully accepted. We were indebted to the officers in charge and staff at each of these places.

The entire tour covered 4,300 miles ; the route and many other details have been reported to the Commissioner of Public Health by the Medical Officer. Results of all laboratory investigations have also been reported to him.

The findings of the laboratory staff were :—

(a) Blood to be collected and serum separated for :
    (i) *Treponemal Serology,* by the Serology Section, Public Health Labs., Perth and the V.D. Reference Laboratory, London.
    (ii) *Serum Proteins,* by the Biochem. Section, Public Health Labs., Perth.
    (iii) *Vitamin B.12 Assay,* by the Haematology Section, Public Health Labs., Perth.
    (iv) *Folic Acid Assay* by the Haematology Section, Royal Perth Hospital.
    (v) *Toxoplasmosis Serology* by the Serology Section, Public Health Labs., Perth.
(b) Blood to be tested for Haemoglobin at site.
(c) Blood films to be spread and fixed for later microscopic examination and differential count by the Haematology Section, Public Health Labs., Perth.
(d) Faeces to be collected into formalin fixative for later examination for ova and parasites, by the Enteric Laboratory, Public Health Labs., Perth.

Equipment

The laboratory equipment carried enabled the above scheme to be carried out and 96 sera, 101 blood films and 24 faecal specimens were returned without loss.

Disposables were used extensively. Because of water shortage, nothing was washed up for re-use except haemoglobin pipettes. Australian-made plastic syringes leaked on an excessive number of occasions. This was an embarrassment because conditions were quite abnormal—the subjects rare and perhaps irreplaceable, as well as shy and fleet of foot.

Two 12 volt centrifuges and a small 12 volt refrigerator proved most useful. The drain on the vehicle's batteries while stationary, caused some concern. Since the night temperatures were in the low forties, it was possible to save current on a number of occasions.

With the exception of the refrigerator, all apparatus was duplicated. None sustained serious damage although the so-called roads (tracks cut by Surveyor Bedells of Woomera some years before) were rough enough to cause damage to some of the vehicles.

The small numbers of desert natives meant that many miles were covered for little " return."

When natives were incountered, it took some time to get into action because :—

1. Our vehicle was loaded with fuel, water, spares, medical equipment, camping gear and food for six weeks for two people, as well as laboratory equipment.
2. The natives were required by other members of the party for interview, anthropology, medical examination, photography, etc.
3. They had to be led up to venipuncture with great delicacy.

Difficulties

Once blood and other specimens were collected, a few problems arose which we were not fully equipped to deal with. These are reported only for the guidance of the planners of possible future expeditions (if there are any natives left to collect blood from).

These were mainly :—

1. *Flies*, which fell on blood films as they were being spread, devouring the blood and being spread with it on occasions.
2. *Red dust and high wind* which upset asepsis and spoiled blood films.
3. *Time* required to do haemoglobin tests (M.R.C. Grey wedge was most satisfactory), and separate sera after allowing clot retraction. Although the leader (Mr. Harman) was most co-operative, one was reluctant to delay the main body in their need for extreme mobility.
4. Daytime *heat* and mechanical damage in rough terrain.

Most of the difficulties could have been overcome by the use of a much larger fly-proof vehicle or trailer with more refrigeration.

Design of Vehicle

If serious laboratory work is to be done under field conditions in the future, consideration would have to be given to the design and construction of such a vehicle. The Land Rover is a fine rugged work-horse, but no laboratory.

Obviously the benefits of a bigger vehicle or trailer would be offset by greater fuel consumption, and difficulties in movement over the sometimes non-existent tracks.

One hopes that sufficient natives remain in this vast area, to justify further tours, and perhaps provide a solution to the serological puzzle.

VI—DEPARTMENTS OF MORBID ANATOMY AND EXFOLIATIVE CYTOLOGY

From Table VI appendix it will be seen that the total number of examinations increased by 20% which represented an increase of over 50% in units of work due to the increases in the year having been in increased necropsies and the tissue examinations arising therefrom.

As stated in the general section on Staff, the recruitment of two senior pathologists in 1964, together with a registrar, considerably eased the situation in all sections of this department, since both pathologists are also competent cytologists ; however, this increase in staff was to some extent offset by the loss of Dr. Topliss, due to ill-health, and the increased responsibility of providing relief staff during sickness and leave of the Police Pathologist. Much of this extra medico-legal work had to be undertaken by the Director. The situation as regards other types of staff is less happy. The chronic and continuing shortage of trained laboratory technicians meant that some of the work had to be left to trainee workers and to laboratory assistants. This is very unsatisfactory, particularly as regards cytology work. There is also a shortage of competent clerical staff.

As regards equipment, the use of tape recorders is a valuable aid. Probably the most urgent need is for a cryostat to replace the present freezing technique for urgent biopsy work, and a second such machine may later have to be purchased and used in the operating theatres.

In September, 1964, after inexplicable delays, the histopathology and cytology processing departments were moved to a mobile type of laboratory in the grounds of the Gairdner hospital. The building is remarkably good for its size, but heat and vibration are adverse factors and one cannot regard this as anything but a stop-gap measure. It is indeed very disappointing to have to record that there is still no sign of the promised new laboratory for the Public Health Laboratory Services.

As already stated, there was an all-round increase in the work of the Department. Surgical biopsies showed much variety, though gynecology and dermatology predominate, as they commonly do in laboatories of this type. One regrets the passing of the Perth Chest hospital which provided an excellent centre for the State for chest pathology.

Findings of special interest in 1964 included two cases of tuberculous endometritis ; calcification of the intima of the aorta in an 8-weeks infant : fifteen cases Enterobius vermicularis infection of the appendix, including four adults, with two showing associated inflammatory changes ; one case of pericardial (spring water) cyst in a woman of 41 years ; one case of struma ovarii in a women of 46 years ; and three cases of cat-scratch disease.

The cytology section of the work also showed a marked increase in work done in 1964 compared with work done in 1963. In 1964, there was only one large cytology survey of " normal " women, a group of over 400 from the Goldfields area. All the remaining specimens were from private practitioners or from the Gairdner Hospital staff.

Very encouraging results are being obtained in the use of sputum cytology since cancer cells have been found in the sputum of more than 70% of individuals examined here for cancer of the lung. Less encouraging results are being found in cytology of cervical smears, this being due very often to poor slides or insufficient material.

4—BRANCH LABORATORIES

The work of the branch laboratories for 1964 has been summarized in Table I.B. in the appendix. The increase in total work is 36% with the increases varying very considerably from laboratory to laboratory ; the older laboratories are now reaching a plateau of work while newer laboratories show the heavy increases common in all new services.

In the branch laboratories the biggest problem is to obtain staff of technologist level. Workers in this classification prefer to remain in Perth to obtain more experience in the large central laboratories, or go overseas. As a result the majority of the branch laboratories are staffed only by one senior technologist who not only has to be capable of carrying out a wide range of skilled tasks, but also has to cope with the heavy flow of material and with all emergencies seven days a week. In such laboratories the senior worker may put in 40–50 hours' overtime per month. This state of affairs cannot continue much longer but it is difficult to see what can be done except to accelerate the training of technologists by cutting the course to three years, as previously suggested.

On occasion, the " emergencies " in country laboratories are somewhat unusual by city standards ; in one country laboratory recently a technologist in charge was called out at 0200 hours because of severe bleeding in a mother just delivered of a " very large baby." It was only after the technologist had reached the laboratory he discovered the large baby to be a foal and the mother a valuable mare !

Unlike the position in the central laboratories, the branch laboratories are not worried by lack of space, even though in certain cases the space consists of caravan accommodation. Unfortunately in the new regional hospitals now being built, the laboratory space is adequate but the design is very bad and it is hoped that the mistakes made in these hospitals will not be repeated in future building.

5—BLOOD TRANSFUSION SERVICES

This service in the country continues to be a joint responsibility of the Red Cross and the Public Health Laboratory Service. Blood storage and transfusion centres have been provided in some of the larger country areas but in the majority of the areas any emergency still requires the bleeding of donors before transfusion can begin. The supply of transfusion centres requires to be increased as soon as possible.

Dr. Brain, the Medical Director of the Red Cross Transfusion Service resigned in 1964 to return to South Africa and we were sorry to see him go.

6—RESEARCH

Shortage of space and of trained laboratory staff has necessitated the limiting of research to problems which are of immediate and pressing importance, e.g., investigation of new techniques and new equipment, investigation of new methods of automation, investigation of " throw-away " equipment and the like. Research continues on heart disease, but only to a limited scale with the major project a combined investigation with the Animal Health Laboratories to test the effect of different diets on the heart conditions of pigs. Much of the cost of this project was borne by Messrs. Boehringer.

7—PUBLICATIONS

During the year the following papers were published by members of the Laboratory staff :

Dr. Wm. Laurie collaborated with Dr. J. D. Woods in :

" Single Coronary Artery. A report of two cases "
published in the " American Heart Journal ", Jan., 1964, Vol. 67, No. 1 (95–98).

Dr. Laurie, Dr. Kovacs and Mr. J. B. Iveson collaborated in the paper :

" An improved method of isolating salmonellae from contaminated desiccated coconut " which was published in tht " Journal of Clinical Pathology ", 1964, Vol. 17, page 75.

Dr. Laurie and Dr. F. E. Heymanson of the Sir Charles Gairdner Hospital had a letter published in the " Medical Journal of Australia ", May 9, 1964, (737–738) under the title :—

> " External Cardiac Massage as a First-Aid Measure ".

Dr. N. Kovacs collaborated with Dr. J. T. Smyth of the Sir Charles Gairdner Hospital and Dr. W. P. Harris of the Repatriation General Hospital, Perth, Western Australia, in

> " Pulmonary Disease due to Unclassified Mycobacteria (Battey Type) : Report of 14 Cases with Histological Confirmation ".
>
> This appeared in " Tubercle ", September, 1964, Vol. 45, No. 3.

Dr. Kovacs' paper " Battey Disease and Bovine Tuberculosis in Australia " was given by him at a meeting of the World Health Organization in Prague, May, 1964. (This paper is in press). Dr. L. O. C. Cookson had the following article published in the " Bulletin of the World Health Organization ", 1964, 31, pp. 799–813 :—

> " Some Modifications of the Fluorescent Antibody Test in Human Bilharziasis ".

8—ACKNOWLEDGMENTS

As is customary in all laboratories, when we are called upon to give information on material rarely seen by us we ask for help from colleagues with specialised knowledge, both at home and abroad. Dr. Koss, of the Sloan-Kettering Institute of New York, has kindly continued to assist us in cytology problems, and Dr. Wilkinson, of the V.D. Reference Laboratory, Whitechapel, London, has continued to provide help in difficult serology problems. We are also much indebted to workers overseas who have provided training for our staff on working holidays outside Australia.

Nearer home, we would again thank the Mental Health Services for the large amount of help given us, and we are particularly grateful to the Physician Superintendent and staff of the Sir Charles Gairdner Hospital for the many kindnesses shown to us.

I, personally, am indebted to all staff within the Laboratory Service for the support given during the year.

Table 1A

PUBLIC HEALTH LABORATORIES—CENTRAL LABORATORIES

SUMMARY OF WORK DONE—1964

Laboratory Sections	Source				1964 Total	1963 Total	1964 Increase
	State	Commonwealth	Gairdner Hospital	Others			
Microbiology :							%
Tests	27,320	2,399	12,447	1,419	43,585	53,050	....
Unit Values	252,046	15,542	76,953	9,271	353,812	439,911	....
Tuberculosis :							
Tests	7,435	37,958	....	....	45,393	45,626	....
Unit Values	62,892	232,190	....	....	295,082	307,888	....
Serology :							
Tests	42,224	3,450	1,107	1,679	48,460	51,656	....
Unit Values	271,736	22,366	8,682	18,165	320,949	297,765	7·8
Haematology :							
Tests	11,534	8,036	35,541	4,893	60,004	53,897	11·3
Unit Values	52,427	28,874	130,766	20,098	232,165	197,298	17·6
Biochemistry :							
Tests	5,372	3,181	13,216	983	22,752	19,257	18·1
Unit Values	34,299	38,405	115,137	11,378	199,219	179,333	11·1
Histopathology :							
Tests	10,957	3,193	4,431	6,217	24,798	20,847	19·0
Unit Values	187,665	48,820	83,115	93,255	412,855	263,477	56·7
Virology :							
Tests	19,382	....	....	....	19,382	23,642	....
Unit Values	128,558	....	....	....	128,558	147,616	....
Totals :							
Tests	124,224	58,217	66,742	15,191	264,374	267,975	....
Unit Values	989,623	386,197	414,653	152,167	1,942,640	1,833,288	6

Table Ib

PUBLIC HEALTH SATELLITE LABORATORIES—SUMMARY OF WORK DONE, 1964

	Albany	Bunbury	Derby	Geraldton	Narrogin	Northam	Wooroloo	Manjimup	Claremont	Carnarvon	Pt. Hedland	Total 1964	Total 1963	1964 Increase
														%
Bacteriology—														
Tests	12,080	6,355	3,778	1,915	3,091	1,486	2,613	2,658	1,070	297	211	35,554	25,195	41·1
Unit Values	26,870	94,823	47,645	17,887	18,721	10,783	8,351	17,923	7,690	4,633	1,573	266,899	176,671	51
Haematology—														
Tests	9,591	12,725	2,899	4,056	6,366	5,266	6,625	3,819	5,899	310	1,008	58,564	42,934	36·4
Unit Values	48,591	74,373	23,022	25,683	26,077	23,413	32,678	17,817	20,905	3,642	5,430	301,631	221,782	36
Biochemistry—														
Tests	1,573	2,996	410	1,188	1,389	924	4,021	722	1,509	86	125	14,943	11,815	26·4
Unit Values	13,417	33,979	5,541	7,538	8,856	5,776	14,690	4,125	10,649	1,551	1,177	107,299	86,841	23·6
Total—														
Tests	23,244	22,076	7,087	7,159	10,846	7,676	13,259	7,199	8,478	693	1,344	109,061	79,944	36·4
Unit Values	88,878	203,175	76,208	51,108	53,654	39.972	65,719	39,865	39,244	9,826	8,180	675,829	485,294	39·2
Increase, 1964—														
Tests	16·2%	30·5%	81·9%	....	44·6%	....	71·6%	42·7%	7 x more	Opened August, 1964	Opened April, 1964			
Unit Values	24%	26·6%	131·1%	....	26·8%	....	75·4%	62·8%	Approx. 6½ more					

Table IIA

GENERAL MICROBIOLOGY AND MYCOLOGY—WORK DONE 1964

Work Done	Source				1964 Total	1963 Total	1964 Increase
	State	Commonwealth	Gairdner Hospital	Others			
General Bacteriology :							
Animal Inoculations	9	36	....	....	45	21	14·3
Blood Specimens	222	123	196	7	548	647	....
C.S.F. Specimens	33	4	65	28	130	75	73·3
Faeces Specimens	79	1	17	....	97	593	....
Foodstuffs : Fresh	290	....	....	....	290	398	....
Foodstuffs : Tinned or Frozen	17	....	....	....	17	15	13·3
Sensitivity Tests	4,034	363	2,436	394	7,227	9,401	....
Serous Effusions	47	58	323	28	456	308	48·1
Sputum	217	696	3,831	134	4,878	5,460	....
Swabs, All Sources	811	307	1,250	288	2,656	2,734	....
Urine Examinations	756	589	3,933	511	5,789	5,511	5
Vaginal Specimens	616	26	66	21	729	441	65·3
Venereal Diseases	2,097	81	38	1	2,217	3,045	....
Water	48	3	1	....	52	412	....
Others	221	34	113	7	375	2,179	....
Total Tests	9,497	2,321	12,269	1,419	25,506	31,240	....
Unit Values	84,362	14,675	75,286	9,271	183,594	235,768	....
Water and Sewerage Surveys :							
Tests	7,855	....	....	....	7,855	7,067	11·2
Unit Values	78,550	....	....	....	78,550	70,670	11·2
Mycology Examinations :							
Tests	6,864	....	....	....	6,864	10,481	....
Unit Values	43,550	....	....	....	43,550	66,233	....
Salmonella :							
Animal Inoculations	45	....	....	....	45	....	....
Blood Specimens	5	....	....	....	5	....	....
Faeces Specimens	2,249	76	178	....	2,503	2,500	....
Foodstuffs : Fresh	203	....	....	....	203	478	....
Foodstuffs : Frozen or Tinned	218	....	....	....	218	613	....
Fertilisers	....	....	....	....	....	60	....
*Sensitivities	....	....	....	....	....	282	....
Sputum	....	....	....	....	....	13	....
Others	384	2	....	....	386	316	22·2
Total Tests	3,104	78	178	....	3,360	4,262	....
Unit Values	45,584	867	1,667	....	48,118	67,240	....
GRAND TOTAL : Tests	27,320	2,399	12,447	1,419	43,585	53,050	....
Unit Values	252,046	15,542	76,953	9,271	353,812	439,911	....

(* Included in General Bacteriology.)

Table IIB

MICROBIOLOGY—TUBERCULOSIS SECTION—EXAMINATIONS IN 1964

Type of Examinations		1964 Total	1963 Total	1964 Increase
Sputum :				%
Direct Smears	74	26,053	28,162	....
Centrifuged Deposits	12,875			
Cultures	12,875			
Direct Guinea Pig Inoculations	229			
Gastric Contents :				
Centrifuged Deposits	324	933	1,490	....
Cultures	388			
Direct Guinea Pig Inoculations	221			
Laryngeal Swabs :				
Centrifuged Deposits	8	23	44	....
Cultures	10			
Direct Guinea Pig Inoculations	5			
Pleural Fluids :				
Sulas	3	434	427	1·6
Centrifuged Deposits	145			
Cultures	145			
Direct Guinea Pig Inoculations	141			
Bronchial Lavage :				
Centrifuged Deposits	93	250	562	....
Cultures	93			
Direct Guinea Pig Inoculations	64			
Cerebral Spinal Fluid :				
Direct Smears	2	29	30	....
Centrifuged Deposits	9			
Cultures	9			
Direct Guinea Pig Inoculations	9			
Urine :				
Direct Smears	3	2,083	1,469	41·8
Centrifuged Deposits	695			
Cultures	695			
Direct Guinea Pig Inoculations	690			
Miscellaneous :				
Direct Smears	4	3,410	....	14·6
Centrifuged Deposits	1,661			
Cultures	1,658			
Direct Guinea Pig Inoculations	577			
Smears for M. Leprae		7	4	....
Virulence Tests		96	165	....
Sensitivity Tests		2,805	2,046	37·1
Confirmation Tests		1,345	....	....
Total Examinations		37,958	37,809	....
Tests for Improvement work carried out during the year of 1964 : (62,892 units)		7,435	7,817	....
Total		45,393	45,626	....

Table IIC

MICROBIOLOGY—VIROLOGY SECTION—WORK DONE, 1964

	State	C'wealth	Gairdner Hospital	Others	1964 Total	1963 Total	1964 Increase
							%
Preparation of Inocula	779	....	....	....	779	560	39·1
Tissue Culture	4,320	....	....	....	4,320	6,689	....
Egg Inoculation	1,792	....	....	....	1,792	1,735	3·3
Animal Inoculation	3,941	....	....	....	3,941	3,566	10·5
Neutralisation	5,311	....	....	....	5,311	8,468	....
Haemadsorption	281	....	....	....	281	309	....
Haemagglutination and Inhibition	2,162	....	....	....	2,162	1,615	33·9
Sterility Tests	571	....	....	....	571	422	35·3
Others	225	....	....	....	225	278	....
Total :							
Tests	19,382	....	....	....	19,382	23,642	....
Unit Values	128,558	....	....	....	128,558	147,616	....

Table III

BIOCHEMISTRY DEPARTMENT—WORK DONE, 1964

Work Done	Source				1964 Total	1963 Total	1964 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Serum/Plasma Tests	1,093	3,063	12,492	856	17,504	15,039	16·4
C.S.F. Tests	51	9	138	60	258	173	49·1
Gastric Contents	....	....	6	....	6	10	....
Effusions	2	23	102	....	127	185	....
Urine Examinations	42	34	290	34	400	367	9
Metabolic Tests	8	2	47	5	62	65	....
Others (including blood collection)	4,176	50	141	28	4,395	3,418	28·6
Total—							
Tests	5,372	3,181	13,216	983	22,752	19,257	18·1
Unit Values	34,299	38,405	115,137	11,378	199,219	179,333	11·1

Table IV

HAEMATOLOGY DEPARTMENT—WORK DONE, 1964

Tests Done	Source				1964 Total	1963 Total	1964 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Red Cells—							
Total levels	270	353	514	270	1,407	1,368	2·9
Haematocrit	422	861	4,280	404	5,967	5,532	7·9
Absolute Values	940	1,549	5,313	912	8,714	8,183	6·5
Sedimentation	320	711	3,194	288	4,513	4,023	12·2
Film Examination	430	822	4,225	405	5,882	5,328	6·3
Fragility Tests	....	....	1	1	2	4	....
Reticulocytes	11	27	185	1	224	315	....
Stipple Cells	....	....	....	....	....	2	....
Hb. Levels	431	862	4,269	415	5,977	5,534	8
White Cells—							
Total	348	688	3,728	336	5,100	5,177	....
Differential	358	684	3,700	318	5,060	5,102	....
L.E. Cells	16	37	75	7	135	88	53·4
Blood Grouping—							
Major	164	76	676	370	1,286	1,558	....
Minor	162	76	676	364	1,278	1,558	....
Compatibility	15	190	1,934	....	2,139	1,467	45·8
Rh Antibodies	43	....	....	461	504	497	1·4
Bone Marrow Examination—	4	1	16	2	23	56	....
Coagulation Tests—							
Prothrombin Time	53	659	1,651	43	2,406	1,891	27·2
Bleeding Time	1	6	59	....	66	47	40·4
Clotting Time	4	11	57	....	72	68	5·9
Clot Retraction	....	4	30	....	34	40	....
Others (including Blood Collection)	7,542	419	958	296	9,215	6,059	52·1
Totals—							
Tests	11,534	8,036	35,541	4,893	60,004	53,897	11·3
Unit Values	52,427	28,874	130,766	20,098	232,165	197,298	17·6

Table V

SEROLOGY DEPARTMENT—WORK DONE, 1964

Work Done	Source				1964 Total	1963 Total	1964 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Treponemal Tests	21,068	1,658	314	....	23,040	27,251	....
Gonococcal Tests	2,190	256	9	....	2,455	2,699	....
Hydatid Tests	224	14	21	....	259	130	99·2
Bacterial Agglutinations	6,307	394	193	....	6,894	5,989	15·1
Rheumatic Tests	1,853	852	141	227	3,073	2,888	6·4
Leptospiral Tests	1,340	16	37	....	1,393	1,622	....
Viral, Rickettsial and Protozoal Tests	6,934	249	368	....	7,551	6,923	9·1
Hormone Tests	579	8	20	1,452	2,059	2,127	....
Medico-Legal Tests	1,467	....	....	....	1,467	1,450	1·2
Others	262	3	4	....	269	577	....
Totals—							
Tests	42,224	3,450	1,107	1,679	48,460	51,656	....
Unit Values	271,736	22,366	8,682	18,165	320,949	297,765	7·8

Table VI

HISTOPATHOLOGY DEPARTMENT—WORK DONE, 1964

Work Done	Source				1964 Total	1963 Total	1964 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Exfoliative Cytology	1,920	1,729	2,795	3,899	10,343	8,406	23
*Autopsies	61	5	90	....	156	99	123·3
Autopsies (Police)	65	....	....	....	65	....	
Sections of Biopsies	5,515	....	....	....	5,515	11,559	14
Sections of Autopsies and Animal Tissue	2,339	1,459	1,546	2,318	7,662		
Others	1,057	....	....	....	1,057	783	35
Total Examinations	10,957	3,193	4,431	6,217	24,798	20,847	19
Units	187,665	48,820	83,115	93,255	412,855	263,477	56·7

* Until the 30th June, 1964, all autopsies included in " State ".

Appendix III

TUBERCULOSIS CONTROL BRANCH

Annual Report for the Year ended 31st December, 1964

The main statistics (Table 1) show that although the population of the State increased since 1963 by 17,000, the total number of notified tuberculosis cases fell from 244 to 208. The incidence of pulmonary tuberculosis continued its decline, reaching 22·3 per hundred thousand. The death rate remained about two per hundred thousand.

NOTIFICATIONS TO THE TUBERCULOSIS REGISTER

These have been classified according to the organism producing disease and form of disease.

Form	Human Tuberculosis	Bovine Tuberculosis	Atypical Mycobacteria
Pulmonary (adult type) ...	146	3	20 Runyon Group II—6 Runyon Group III—14
Pulmonary (childhood type)	1	....	....
Pleurisy with effusion	1	....	....
Non-pulmonary :			
Glands	8	....	3 (All Runyon Group III)
Genitourinary	15	1	....
Bone and Joint	2	....	....
Miliary	1	....	....
Bowel	1	....	....

There were also six transfers in from other States.

It will be seen that there are included in the notifications 23 patients with invasive disease due to an atypical mycobacterium, of whom three had lymph node infections. Thirty were re-notifications, including two in the atypical groups.

SOURCE OF NOTIFICATIONS

Thirty-five per cent. of patients were diagnosed through Chest Clinic activities, 21 per cent. through mass surveys and 21 per cent. by private practitioners (graph No. 1).

STATE OF REGISTER

Two hundred and forty patients were removed from the " active " register, 162 because their disease was sufficiently controlled, 19 having left the State and 59 having died. At the end of the year the active register contained 1,343 names. The file of previous cases contained some 7,000 names, including those who have been recorded as deceased.

DEATHS

The 20 classified tuberculosis deaths were caused by :—

Progressive pulmonary infection due to—	
(a) M. Tuberculosis	12
(b) Atypical mycobacteria, Group III	2
Old healed tuberculosis with extensive fibrosis and cor pulmonale	6

RENOTIFIED CASES

These represented 15 per cent. of all notifications. There has been a persisting level of breakdown at about this rate over the last few years. An examination of patient histories discloses the following interesting facts concerning treatment :—

(a) Patients who had never received chemotherapy—	
Rest treatment only	7
Thoracoplasty	1
(b) Patients who had received chemotherapy, though inadequate by present standards—	
Without surgery	13
With surgery—	
Artificial Pneumothorax	1
Plombage	3
Resection	1

(c) Patients who had received adequate chemotherapy .... *Nil*

(d) Patients who originally had never received treatment as their disease was finally considered inactive after investigation 2

(e) Patients renotified because of reactivation of disease due to atypical mycobacteria 2

It would seem that revision courses of adequate chemotherapy for patients on the register of previous cases, inadequately treated in the past, might prevent many of the breakdowns. Co-operation of patients in such a scheme would however be very doubtful.

TUBERCULOSIS IN CHILDREN

Notifications of serious disease in this group remain very low. One child, however, died at five weeks old from congenital tuberculosis. This proved to be an extraordinary case due to an unusual set of circumstances, the child's pulmonary infection having originated from a localized tuberculous endometritis in an absolutely symptomless mother.

There was the usual quota of infected lymph nodes, eight in all, of which three were proven bacteriologically to have been due to Battey bacilli (Group III). In one other child M. Tuberculosis was cultered from the infected glands. The remaining five have been classified under the heading of " human tuberculosis," for want of a better. In these, microscopic examination showed a typical histological pattern and acid-fast bacilli were seen in the section, but cultures for mycobacteria proved negative. Simultaneous skin testing with PPD-B and PPD-S (five T.U. of each) resulted in four of these children showing a marked reaction to PPD-B, but little or no reaction to PPD-S. It is therefore reasonable to assume their lymph nodes were infected by atypical bacilli.

BACTERIOLOGY

Seventy-seven per cent. of notified cases were found to be bacillary positive on initial investigation.

Drug Resistance

Of the patients excreting M. Tuberculosis during the year, 14 (9·5 per cent. of total bacillary positive patients) were already resistant or became resistant to Streptomycin, eight (5·4 per cent.) to P.A.S., and 15 (10 per cent.) to Isoniazid. Five (3·4 per cent.) showed resistance to two of the standard drugs, and seven (4·8 per cent.) to all three.

Eighteen patients in all showed resistance to one or more of these drugs. At the end of the year, four had become bacillary negative, eight were classed as bacillary positive chronic resistant, one had died from pulmonary tuberculosis and five had died from other causes.

No patients showed primary resistance to any of the standard drugs. In two cases there was primary resistance to Ethionamide.

Second Line Drugs

Some patients whose organisms developed resistance to first line drugs have been converted by the judicious use of Pyrazinamide and Ethionamide, and recently Ethambutol has been added to the armamentarium. Cycloserine and Viomycin have proved disappointing chiefly on account of the occurrence of severe side reactions.

ATYPICAL (ANONYMOUS) MYCOBACTERIA

Table 8 shows the patients from whom these organisms were isolated for the first time. Battey type mycobacteria (Group III) predominated as in previous years. M. Kansasii is rarely isolated. Each year about 100 identifications of these mycobacteria are made from human sources, of which one in six indicates a true mycobacterial infection. Isolations are rarely made from patients with radiologically normal lung fields. The associated lung conditions constitute a wide range of acute and chronic disease.

In 1964, 23 patients had actual infection due to these mycobacteria, 20 having pulmonary disease. Using strict criteria for diagnosis, the incidence of pulmonary disease in the last six years has been found to be of the order of 2–3 per hundred thousand. These infections thus pose no great public health problem, difficulties arising mainly in diagnosis and treatment. Considerable success has been obtained with resection or thoracoplasty in selected cases. Treatment with ordinary antituberculous drugs is of very doubtful value, the organisms being resistant in vitro, with the exception in some cases of Cycloserine and Viomycin. The latter two drugs have not been used very much owing to their side effects, but recently a new drug, B663, has been found effective in vitro against Western Australian strains of Group III organisms and will shortly be tried in treatment.

Results of treatment of patients notified with atypical disease during 1964 are worth reporting in detail. Of the six suffering from pulmonary infection due to scotochromogens, one had a right upper lobectomy, resulting in sputum conversion ; four converted on first line antituberculous drugs only, and one whose condition was complicated by asbestosis died, although a thoracoplasty had been performed in order to control his disease. Of the 14 patients suffering from Battey disease, three became bacillary negative following thoracoplasty and one was cured by segmental resection. Seven who were treated with first line drugs all remained positive, one died of carcinoma of the stomach and one of atypical disease without having received treatment. One other patient who received no treatment is still bacillary positive.

MASS COMPULSORY SURVEYS

Surveys were continued in various country areas, covering the following parts of the State :—

	Number of Shires
Outer Metropolitan	4
South-West	12
Southern Agricultural	16
Central Agricultural	15
Northern Agricultural	13
Eastern Goldfields	10
Total	70

Eighty-four thousand four hundred and twenty-seven persons attended for X-Ray, the incidence of active tuberculosis cases being 0·39 per thousand micro films taken. The total attendance represented 90 per cent. of the population required under the Health Act to be X-Rayed. Attenders were checked against electoral rolls.

MINING AREAS

There was a considerable reduction in the number of miners in the industry reported with pulmonary tuberculosis, as compared with the previous year. Two cases of simple tuberculosis, one of silicotuberculosis, and one of asbestosis with silicosis and tuberculosis were notified. This is less than a quarter of the 1963 figure (17). There is, however, no reason for complacency as the incidence of tuberculosis in this group has fluctuated considerably in the last 15 years. In addition, the number of miners developing high risk pneumoconiosis is still high—73 new cases of silicosis, 11 of asbestosis and four of silico-asbestosis, being reported during the year. It appears that all workers who have spent any appreciable time in the mining or processing of asbestos will eventually show evidence of asbestosis, and a proportion of these will ultimately develop mycobacterial infection.

The compulsory mass X-Ray survey (the fourth of a series since the early 1950's) of the non-mining population of the Goldfields area resulted in a very low case rate, *i.e.*, 0·2 per thousand persons examined. For the future the danger could come from miners with already damaged lungs due to pneumoconiosis who contract tuberculosis, which may then be passed on to persons outside the industry.

Pneumoconiosis patients who develop disease due to atypical mycobacteria do badly under treatment.

PERSONS BORN OUTSIDE AUSTRALIA

Tables 5 and 6 show that the higher incidence in this group as compared with the Australian-born was maintained, the proportion being 2 to 1 for both sexes. Table 7 shows that infectious cases are still being found amongst recently arrived British full-fare paying passengers.

Every person arriving by air or sea in 1964 was circularized with a request to attend for a chest X-Ray. Eight thousand seven hundred and forty-one persons (46 per cent.) attended. However, an unknown number were in fact returning Australians. Passenger lists supplied by the Department of Immigration were not detailed enough for the latter to be distinguished from genuine new arrivals.

VISITING SISTERS AND DOMICILIARY CHEMOTHERAPY

Two hundred and sixty-eight patients had home drug treatment, including 15 on second line drugs. Responsibility for supervision rested mainly with the visiting Sisters. In all 3,018 visits were made to patients in their homes.

Patients were graded for reliability as follows :—

Reliable drug takers	203
Fair drug takers	33
Poor drug takers	32
	268

F. G. B. EDWARDS, B.A., LL.B., M.B., B.S., F.C.C.P.

Table 1

TUBERCULOSIS—MAIN STATISTICAL FIGURES

Year	Mean Population 1,000's	Notifications				No. on Register (Pulm.) at 31st Dec.	No. on Register per 100,000 (Pulm.)	Number Receiving T.B. Allowance at 31st Dec.	Deaths			Death Rate per 100,000	
		Pulm. (incl. Pleural effus.)	Non-Pulm.	Total	Pulm. per 100,000				Pulm.	Non-Pulm.	Total	Pulm.	All Forms
1950	558	586	18	604	104·8	2,100	376	515	125	3	128	22·4	22·9
1951	580	467	37	504	80·4	2,402	413	474	76	6	82	13·1	14·1
1952	601	508	49	557	84·5	2,574	428	396	75	7	82	12·5	13·6
1953	621	378	34	412	60·6	2,762	445	361	43	3	46	6·9	7·4
1954	640	348	34	382	54·3	2,769	432	326	57	4	61	8·9	9·5
1955	659	413	39	452	62·7	2,965	450	330	31	2	33	4·7	5·0
1956	677	424	44	468	62·6	2,900	428	264	43	3	46	6·3	6·8
1957	692	332	32	364	47·9	2,786	403	198	36	1	37	5·2	5·3
1958	706	355	24	379	50·3	2,726	386	213	22	4	26	3·1	3·4
1959	726	320	34	354	44·1	2,684	369	182	24	....	24	3·3	3·3
1960	731	296	34	330	40·5	2,388	327	148	29	1	30	4·0	4·1
1961	737	209	41	250	28·4	1,349	183	89	18	1	19	2·4	2·6
1962	755	243	25	268	32·2	1,333	177	90	24	4	28	3·2	3·7
1963	773	216	28	244	27·9	1,218	158	92	13	....	13	1·7	1·7
1964	790	176	32	208	22·3	1,221	154	88	20	....	20	2·5	2·5

Table 2

ANNUAL NOTIFICATIONS OF PULMONARY TUBERCULOSIS SHOWING STAGE OF DISEASE*

Year	Parenchymal Disease						Pleural Effusion		Total
	Minimal		Moderately Advanced		Advanced				
		%		%		%		%	
1952	122	24·0	275	54·1	101	19·9	10	2·0	508
1953	98	25·9	210	55·5	65	17·2	5	1·4	378
1954	96	27·6	178	51·1	74	21·3	....	....	348
1955	111	26·9	225	54·5	64	15·5	13	3·1	413
1956	127	38·0	217	51·1	72	17·0	8	1·9	424
1957	102	30·7	163	49·1	61	18·4	6	1·8	332
1958	91	25·6	187	52·7	72	20·3	5	1·4	355
1959	103	32·2	151	47·2	55	17·2	11	3·4	320
1960	89	30·1	144	48·6	49	16·6	14	4·7	296
1961	90	43·1	73	34·9	34	16·3	12	5·7	209
1962	117	48·1	84	34·6	36	14·8	6	2·5	243
1963	99	45·8	89	41·2	26	12·0	2	1·0	216
1964	71	40·3	81	46·0	23	13·1	1	0·6	176

* Classified according to Diagnostic Standards N.T.A.

Table 3

TUBERCULOSIS NOTIFICATIONS FOR THE YEAR ENDED 31st DECEMBER, 1964

Showing Age, Sex, Form and Stage of Disease

Age Group	Males					Females					Persons					Total
	Pulmonary			Non-Pulm.	Pleur. Effus.	Pulmonary			Non-Pulm.	Pleur. Effus.	Pulmonary			Non-Pulm.	Pleur. Effus.	
	Min.	Mod.	Adv.			Min.	Mod.	Adv.			Min.	Mod.	Adv.			
0- 4	....	....	1	2	....	1*	....	....	4	....	1	....	1	6	....	8
5- 9	....	....	....	....	....	....	....	....	3	....	....	....	....	3	....	3
10–14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
15–19	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	1
20–24	2	1	1	....	....	1	....	....	1	....	3	1	1	1	....	6
25–29	2	1	....	1	....	....	2	....	2	....	2	3	....	3	....	8
30–34	1	....	1	....	....	4	....	....	4	....	5	....	1	4	....	10
35–39	1	5	2	2	....	2	1	....	1	....	3	6	2	3	....	14
40–44	7	6	1	1	....	2	3	....	1	1	9	9	1	2	1	22
45–49	8	4	3	2	....	4	2	....	1	....	12	6	3	3	....	24
50–54	5	11	2	1	....	1	4	....	....	....	6	15	2	1	....	24
55–59	6	8	6	1	....	4	2	....	1	....	10	10	6	2	....	28
60–64	4	5	2	1	....	....	3	....	1	....	4	8	2	2	....	16
65–69	4	9	2	....	....	1	....	....	....	....	5	9	2	....	....	16
70–74	4	6	1	1	....	1	1	1	....	....	5	7	2	1	....	15
75–	5	6	....	1	....	1	....	....	....	....	6	6	....	1	....	13
N/S.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	49	63	22	13	....	22	18	1	19	1	71	81	23	32	1	208

* Primary Tuberculosis.

Table 4

ANALYSIS OF REGISTER AS AT 31st DECEMBER, 1964

A. Pulmonary Tuberculosis
(excluding Pleural Effusions)

Activity	Number on Register according to original extent of lesions			Total
	Minimal	Moderate	Advanced	
Active	100	125	36	261
Quiescent—				
0–1 year	1	1	1	3
1–2 years	....	1	1	2
2–3 years	....	1	1	2
3–4 years	....	....	1	1
4–5 years	....	2	....	2
5+ years	....	2	2	4
Inactive—				
0–1 year	28	24	12	64
1–2 years	83	63	14	160
2–3 years	75	64	24	163
3–4 years	63	83	25	171
4–5 years	64	112	26	202
5+	45	98	30	173
Total	459	576	173	1,208

B.	Pleural Effusion	13
C.	Non-pulmonary Tuberculosis	122
	Total (all forms)	1,343

Table 5

WESTERN AUSTRALIA : TUBERCULOSIS INCIDENCE BY COUNTRY OF BIRTH, 1958–1964 : MALES

Country of Birth	Population at June 30, 1961 : Thousands Census	Incidence per Thousand Persons							Total Notifications 1958–1964
		1958	1959	1960	1961	1962	1963	1964	
United Kingdom and Republic of Ireland	44·4	1·53	0·89	1·00	0·92	0·93	0·66	0·67	295
Germany	2·7	....	....	0·74	0·74	0·37	....	....	5
Greece	2·3	3·33	1·36	0·45	0·87	0·87	0·43	....	16
Italy	14·9	1·18	1·00	1·51	1·01	0·91	0·70	0·60	101
Netherlands	6·2	0·71	0·17	0·17	0·16	0·64	0·31	....	13
Poland	2·8	1·72	2·76	1·79	2·50	0·33	1·85	1·07	34
Yugoslavia	3·6	2·72	2·94	2·85	1·39	1·08	1·58	1·11	48
Other European	5·7	1·90	0·17	0·86	1·40	1·05	0·70	1·05	41
Other Birthplaces	8·1	1·45	1·04	2·02	0·86	1·09	1·19	0·74	67
Total non-Australian born	90·7	1·48	0·95	1·19	0·97	0·89	0·74	0·64	620
Australian-born*	284·8	0·51	0·62	0·49	0·30	0·37	0·34	0·31	839

* Full-blood aborigines excluded.

Table 6

WESTERN AUSTRALIA : TUBERCULOSIS INCIDENCE BY COUNTRY OF BIRTH, 1958–1964 : FEMALES

Country of Birth	Population at June 30, 1961 : Thousands Census	Incidence per Thousand Persons							Total Notifications 1958–1964
		1958	1959	1960	1961	1962	1963	1964	
United Kingdom and Republic of Ireland	38·9	0·57	0·47	0·41	0·23	0·29	0·31	0·26	98
Germany	2·9	0·71	0·36	....	0·34	....	0·34	....	5
Greece	1·8	0·62	0·59	....	0·55	0·52	0·50	1·11	7
Italy	10·3	0·48	0·55	0·31	0·68	0·27	0·26	0·09	26
Netherlands	5·0	....	0·22	0·21	....	0·39	....	....	4
Poland	1·9	1·00	2·63	0·53	0·53	0·56	....	2·10	14
Yugoslavia	2·3	0·50	0·95	0·45	....	1·67	1·60	....	12
Other European	4·0	0·51	1·25	1·50	0·75	0·73	....	0·25	20
Other Birthplaces	6·6	0·82	0·16	0·31	0·45	0·29	0·14	0·45	17
Total non-Australian born	73·7	0·56	0·55	0·42	0·34	0·36	0·29	0·28	203
Australian-born*	287·4	0·25	0·21	0·19	0·16	0·16	0·13	0·14	353

* Full-blood aborigines excluded.

Table 7

NOTIFICATIONS OF BRITISH FULL-FARE PAYING PASSENGERS

Year of Notification	Persons Notified				Total
	Within One Year of Arrival	One to Five Years after Arrival	Five to Ten Years after Arrival	More than Ten Years after Arrival	
1958	1	6	3	59	69
1959	4	1	6	32	43
1960	1	1	4	44	50
1961	2	2	3	35	42
1962	2	2	1	24	29
1963	2	....	1	13	16
1964	3	2	1	13	19
Total	15	14	19	220	268

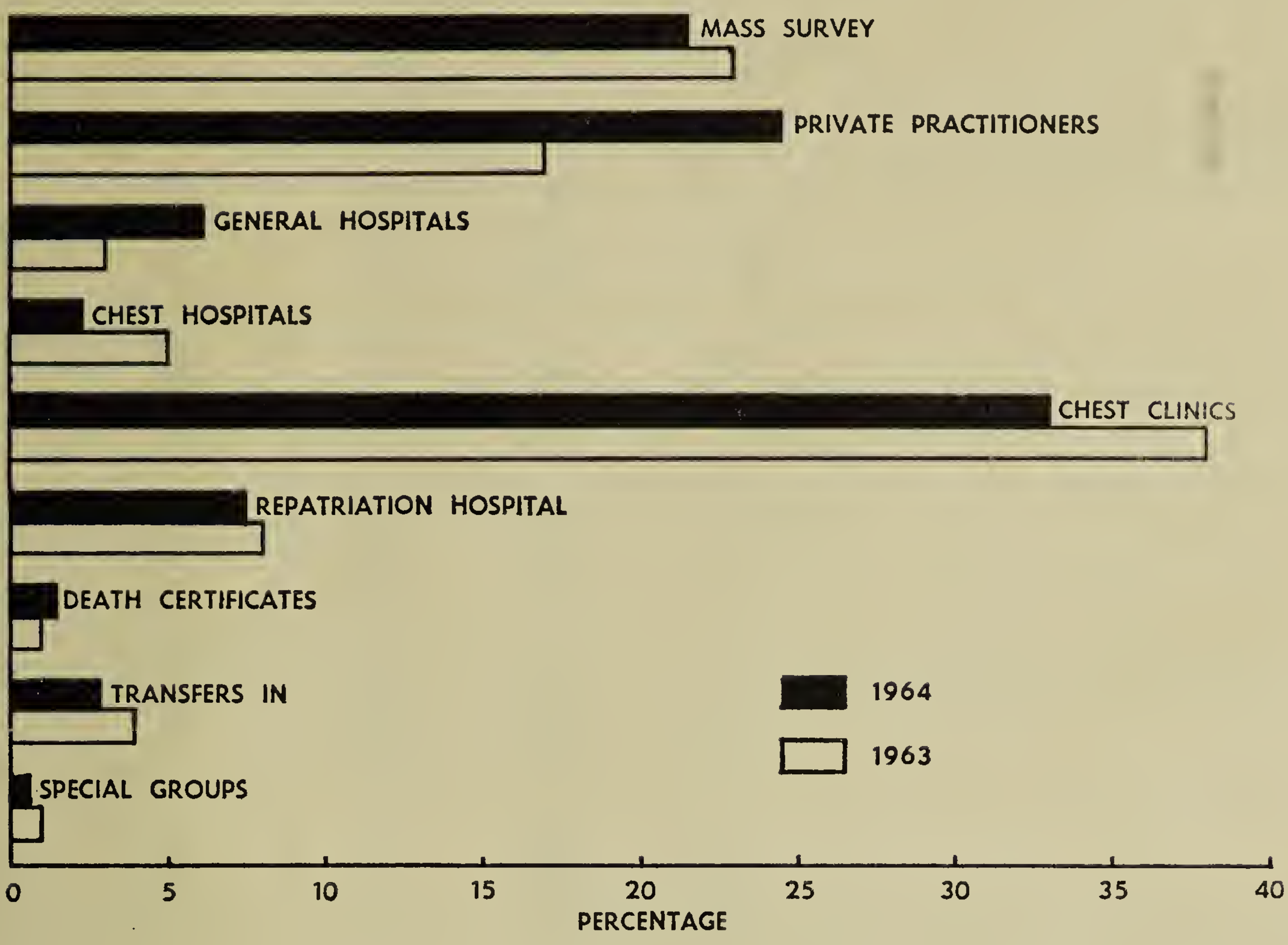
Table 8

PATIENTS FROM WHOM ATYPICAL MYCOBACTERIA WERE ISOLATED (FOR THE FIRST TIME) IN 1964

Runyon Group	Casual Isolations	Intermittent Isolations	Persistent Isolations				Total
			Atypical Tuberculosis			Other	
			Pulm.	Non-pulm.	Total		
I	....	....	....	....	....	....	....
II	8	....	4	....	4	....	12
III	56	7	15	3	18	1	82
IV	10	1	....	....	....	....	11
Total Patients	74	8	19	3	22	1	105

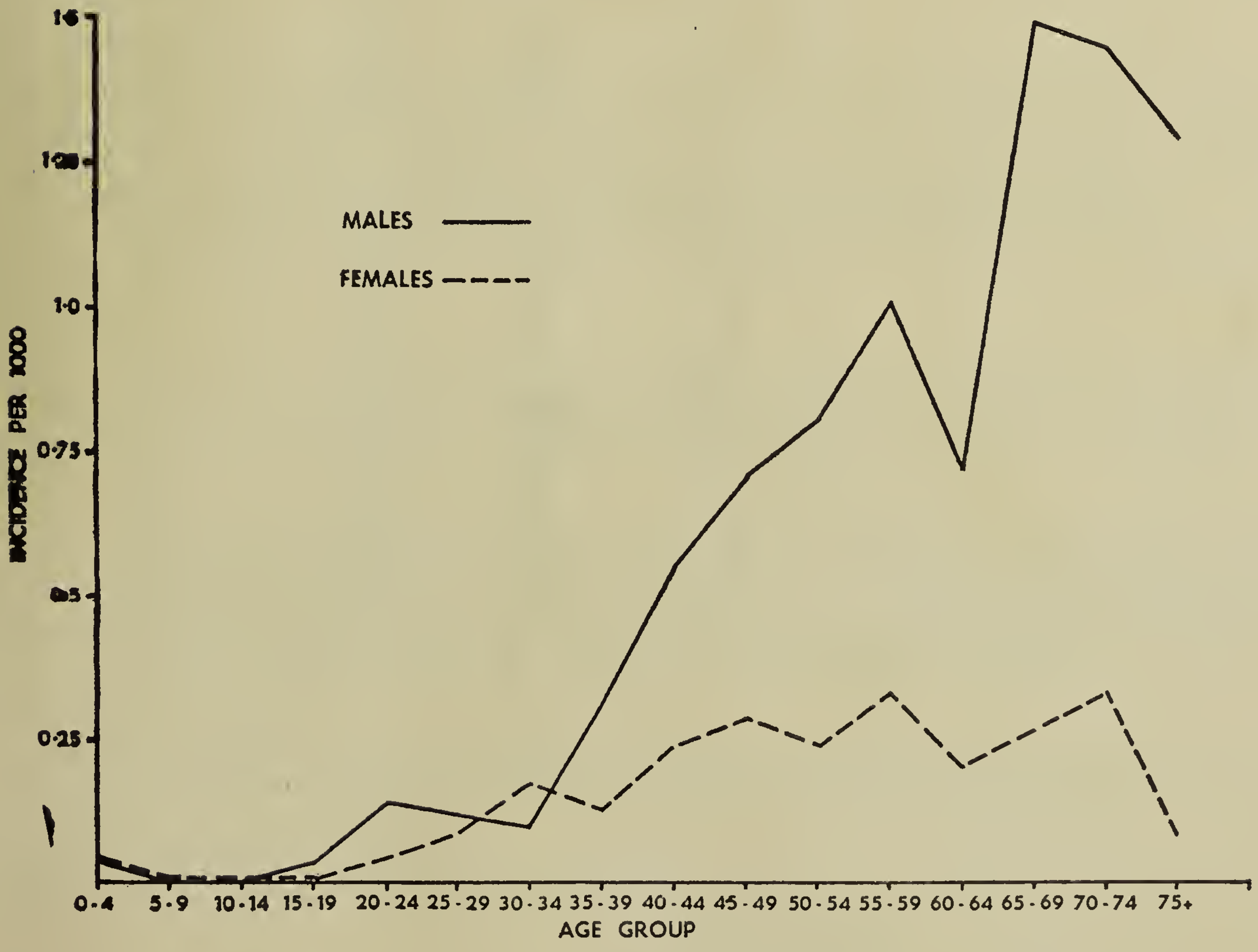
No. 1

GRAPH SHOWING THE SOURCE OF NOTIFICATION OF CASES OF PULMONARY TUBERCULOSIS AS PERCENTAGE OF TOTAL NOTIFICATIONS



No. 2

GRAPH SHOWING THE INCIDENCE PER 1000 IN AGE GROUPS FOR PULMONARY TUBERCULOSIS IN 1964



APPENDIX

Western Australia

PULMONARY TUBERCULOSIS

Year	Population in 1,000s	Notifications Received	Incidence Rate per 100,000 Population	Deaths Registered	Mortality Rate per 100,000 Population
1911	287	259	90·2	190	66·2
1912	301	429	142·5	220	73·1
1913	313	424	135·5	206	65·8
1914	323	353	109·3	229	70·9
1915	321	336	104·7	233	72·6
1916	313	511	163·5	225	71·9
1917	306	464	151·6	217	70·9
1918	308	432	140·5	245	79·5
1919	320	467	145·9	289	91·6
1920	330	442	133·9	259	78·4
1921	334	424	126·9	277	82·9
1922	341	387	113·8	256	75·1
1923	351	361	102·8	216	61·5
1924	363	381	104·6	228	62·8
1925	373	403	108·4	259	69·4
1926	381	415	108·2	252	66·1
1927	392	409	104·3	231	56·4
1928	408	395	96·8	282	69·1
1929	421	400	95·0	245	53·4
1930	429	569	132·6	218	50·8
1931	432	372	86·1	223	51·6
1932	435	339	77·9	203	46·7
1933	439	295	67·2	207	47·2
1934	442	287	64·9	218	49·3
1935	447	270	60·4	210	47·0
1936	452	338	74·8	193	42·7
1937	457	239	53·0	172	37·6
1938	464	247	53·2	177	38·1
1939	470	202	43·0	179	38·1
1940	473	231	48·8	181	38·3
1941	474	154	32·5	185	39·0
1942	477	113	23·7	175	36·7
1943	477	273	57·3	144	30·2
1944	481	219	45·4	134	27·9
1945	488	271	55·5	149	30·5
1946	493	343	69·6	163	33·1
1947	502	372	74·0	128	25·4
1948	515	325	63·1	157	30·5
1949	533	499	93·6	123	23·1
1950	558	586	104·8	129	23·1
DEATH CLASSIFICATIONS ACCORDING TO 6th (1948) INTERNATIONAL LIST					
1950	558	586	104·8	125	22·4
1951	580	467	80·4	76	13·1
1952	601	508	84·5	75	12·5
1953	621	378	60·6	43	6·9
1954	640	348	54·3	57	8·9
1955	659	413	62·7	31	4·7
1956	677	424	62·6	43	6·3
1957	692	332	47·9	36	5·2
1958	706	355	50·3	22	3·1
1959	726	320	44·1	24	3·3
1960	731	296	40·5	29	4·0
1961	737	209	28·4	18	2·4
1962	755	243	32·2	24	3·2
1963	773	216	27·9	13	1·7
1964	790	176	22·3	20	2·5

Appendix IV

Epidemiology and Special Services

ANNUAL REPORT, 1964

The immunisation programme against poliomyelitis and other infectious diseases was maintained at a steady pace throughout the year. Instances of sporadic typhoid and other significant infections were investigated ; and gamma globulin was employed on a group basis in various institutions to control outbreaks of hepatitis.

Poliomyelitis

Salk Vaccine remains the sole agent used in the prevention of poliomyelitis in W.A. ; and a high rate of protection has been substained.

Salk Vaccine has been given by static clinics, by two mobile clinics covering country areas regularly (each clinic averaging 30,000 miles yearly), and by General Practitioners in the metropolitan area. A number of local health authorities also run anti-poliomyelitis clinics. Metropolitan Medical Practitioners have the vaccine delivered to them and it is also sent to the N.W. Medical Service and some country clinics.

The Public has accepted the need for a fourth Salk injection as shown by the pleasing response in the pre-school and school age groups—149,296. Of the larger number in the older age groups 109,725 received fourth injections.

During the year Salk injections numbered 68,641 ; of these the pre-school age group numbered 49,578.

The grand total of injections since 1956 is 1,863,367, excluding 10,134 quadruple injections given in 1961.

Tables showing the immunisation status of the population of Western Australia, and the incidence of poliomyelitis, are to be found at the end of this report.

It is gratifying that there was no authenticated case of poliomyelitis in Western Australia during the year 1964.

General Immunisation

General immunisation against diseases other than poliomyelitis is also given at the Central Clinic, by Local Health Authorities and General Practitioners, and by the Mobile Clinics in country areas without medical services. For this reason it is necessary for the Mobile Clinics to make three successive visits twice a year ; as a consequence the immunisation rate of babies, in areas without medical services, is being increased. This applies also to *Tetanus Immunisation* which is very low in Western Australia as elsewhere in adults. In children tetanus immunity is high, due to the widespread acceptance of triple antigen and CDT by parents for their children. Both vaccines are effective against tetanus.

Smallpox vaccination is not widely availed of. At the Central Clinic 61 children received primary vaccination.

Injections for the year against diseases other than poliomyelitis totalled 13,211 of which 6,754 were given by the Mobile Clinics.

Tasmanian Sabin Project

During the year an invitation from the Tasmanian Authorities to send a West Australian Medical Officer to Hobart to observe their Sabin trial in progress, was accepted. Dr. R. Allen spent about a week in Tasmania and reported that, despite a number of unexpected problems, the project had proved practicable and successful. Some 60,000 triply-Salked children had been given two doses of Sabin vaccine. No untoward incidents had been reported and there were indications that immunity had been reinforced.

Dr. Allen's observations will prove very helpful in the event of the Oral Vaccine becoming available in W.A. at some future time.

Other Immunisations

A number of immunisations, other than Salk Vaccination, were carried out at the Central Clinic in response to specific requests; and infant immunisations with triple antigen were undertaken by Mobile Clinics in the country in under-doctored areas. This Service has been well appreciated by local people.

Influenza Vaccine

The study connected with the effect of polyvalent influenza virus vaccine on absenteeism due to respiratory illness, was continued during the year. The Service records of over 500 vaccinated public servants were analysed against an equivalent number of unvaccinated persons. Little difference was noted but the comparative absence of influenza during the period under review made it impracticable to draw useful conclusions. The value of routine influenza vaccination still appears to be uncertain.

General Medical Examinations

In order to relieve the District Medical Officer, responsibility has been assumed for medical examination of candidates to the Public Service. About 450 men were examined for this purpose.

Venereal Disease and Trachoma Control

Separate reports by Dr. Allen are appended.

Dr. B. H. LEWIS,
Senior Medical Officer, Epidemiology Branch.

POLIOMYELITIS INCIDENCE

(Since Salk Vaccination began on 1st July, 1956)

Year	Not Vaccinated		Vaccinated		Total
	Non-Paralytic	Paralytic	Non-Paralytic	Paralytic	
1956	1	1	....	....	2
1957	....	3	....	....	3
1958	....	1	....	....	1
1959	....	2	....	3	5
1960	....	3	....	....	3
1961	....	2	....	....	2
1962	....	3	....	1	4
1963	....	3	....	2	5
1964	....	....	....	....	....
Total	1	18	....	6*	25

* 1 dose	2
2 doses	1
3 doses	2
4 doses	1

Case No.	Year	Sex	Age	Virus Type	Vaccination Status
1	1956	M.	24	....	Unvaccinated
2	1956	M.	28	....	Unvaccinated
3	1957	M.	7	....	Unvaccinated
4	1957	M.	10	....	Unvaccinated
5	1957	M.	23	....	Unvaccinated
6	1958	M.	40	....	Unvaccinated
7	1959	M.	2	III	3 doses (onset 3 days after third dose)
8	1959	M.	3/12	....	Unvaccinated
9	1959	M.	2	....	2 doses
10	1959	F.	3	....	1 dose
11	1959	M.	7	III	Unvaccinated
12	1960	M.	7/12	....	Unvaccinated
13	1960	M.	3	I	Unvaccinated
14	1960	M.	1½	I	Unvaccinated
15	1961	F.	2	I	Unvaccinated
16	1961	M.	3	III	Unvaccinated
17	1962	F.	41	I	Unvaccinated
18	1962	F.	3	III	3 doses (onset 2 years after third dose)
19	1962	F.	28	III	Unvaccinated
20	1962	M.	37	III	Unvaccinated
21	1963	M.	11	III	Unvaccinated
22	1963	F.	35	....	1 dose
23	1963	M.	2	III	Unvaccinated
24	1963	M.	5	? II	4 doses (onset 6 months after fourth dose)
25	1963	M.	26	? II	Unvaccinated
	1964	Nil	....	....	....

ANNUAL SALK INJECTIONS SINCE 1st JULY, 1956, WHEN SALK VACCINATION BEGAN

Year	No. of Separate Injections
1956	224,466
1957	415,166
1958	273,017
1959	309,914
1960	140,590
1961	59,964*
1962	177,989
1963	203,754
1964	68,611
Total	1,873,471

* Includes 10,134 Quadruple injections in 1961.

ANALYSIS OF NUMBERS OF SALK INJECTIONS

1st July, 1956, *to* 31*st December,* 1964

Age Group	4th Injection	3rd Injection	2nd Injection	1st Injection	Total Injections
Under 15 years	149,296	268,615	305,219	320,373	1,043,503
15 years and over	109,142	218,867	233,771	258,084	819,864
All Ages	258,438	487,482	538,990	578,457	1,863,367

In addition to the above total, 10,134 injections of Salk-containing Quadruple Vaccine were given in 1961, making the grand total of 1,873,471 separate injections in this State.

SALK VACCINATIONS STATUS FOR WESTERN AUSTRALIA AT 31st DECEMBER, 1964

Age Group	Four Injections	Three Injections Only	Two Injections Only	One Injection Only	1st, 2nd, 3rd and 4th Injections
Under 15 years	149,296	119,319	36,604	15,154	320,373
Over 15 years	109,142	109,725	14,904	24,313	258,084
Total, All Ages	258,438	229,044	51,508	39,467	578,467

SALK VACCINATIONS

Total Injections Given from 1st January, 1964—31st December, 1964

All Ages Adjusted

Age Group	4th Injection	3rd Injection	2nd Injection	1st Injection	Total Injections
0–4	6,255	11,563	12,897	13,905	44,620
5–9	2,616	2,173	2,106	2,295	9,190
10–14	687	391	266	337	1,681
Total, 0–14	9,558	14,127	15,269	16,537	55,491
15–19	478	134	105	144	861
20 and Over	5,046	3,063	2,030	2,150	12,289
Total, 15 and Over	5,524	3,197	2,135	2,294	13,150
Total, All Ages	15,082	17,324	17,404	18,831	68,641

To the Commissioner of Public Health :

INVESTIGATION INTO REACTIONS TO TETANUS TOXOID BP, 1964–65

For some time there has been concern about undue reactions to Tetanus Toxoid. This was first noticed when 90 men at a Government Engineering establishment were immunised with Tetanus Toxoid APA (CSL). About 5% had severe reactions, mainly in the older age groups. This was attributed at the time to the possibility that the reactors may have received previous but unremembered Tetanus Toxoid injections. Some reactions were so severe that further injections were refused. The booster doses in those who had not reacted to the first injections caused similar reactions.

When further immunisations were undertaken on another group of Government workmen (900), a small slip was given to each man asking for details of subsequent reactions. A number of these were returned showing similar reactions to Tetanus Toxoid APA (CSL). As some suspicion attached to the Aluminium Phosphate portion of the Vaccine a series of injections with Tetanus Toxoid APA, with reduced Aluminium Phosphate, was given with a control series of injections of Tetanus Toxoid BP (CSL). In each series the results were much the same as with the first group, thus exonerating Aluminium Phosphate.

In a third group a proprietary imported brand of Tetanus Toxoid BP was used and a questionnaire was given to each of the 150 injected. Of these 125 returned the forms—seven of them receiving two injections. A resume of the results of the injections given here was made and the results analysed. A resume of the histories of previous injections was made and found to correspond to the present series, the incidence of reactions being about the same. These figures depend on the subjects' memories, and, taken with the fact that the type of Vaccine was not known, makes their acceptance as factual impossible, though informative.

Resume of 32 First Injections given here only one (a female) had a slight reaction ; of 33 Second Injections given here no reaction ; of 37 Third Injections given here eight had severe reactions, five moderate reactions, four slight reactions—two males only ; of 30 booster injections given here two had severe reactions, one moderate, and three slight, all being female.

This gives a Female/Male ratio of 11/1—no reason being obvious.

Some of the severe reactions were seen personally when the arm and forearm were both grossly swollen, the upper arm being red and shiny and later on black and blue and green. Needless to say these people were incapacitated.

Immunisation Procedure

The Tetanus Toxoid was at room temperature and well shaken. A separate dry-sterilised needle was used for each injection. The injection was given (deep subcutaneous—intramuscular). The injection site was compressed gently between thumb and forefinger after withdrawal of the needle.

Conclusions

The liability to reactions following Tetanus Toxoid inoculation appears to increase with subsequent inoculations. The Aluminium Phosphate component of the injected material does not appear to play a significant part in influencing these reactions.

More reactions occurred in females and increasing age appears to influence severity of reaction.

First and second injections are almost always without reaction ; the only reaction out of 65 first and second injections was a female, 34 years of age.

Suggestions

Recent publications suggest that immunity to Tetanus can be maintained with booster doses of Tet. Tox. APA 0.05 ml. It may therefore be worthwhile considering a reduction in dosage for third and subsequent injections to 0.1 ml. of Tet. Tox. APA. The booster emergency doses in case of accident could be retained at Tet. Tox. BP 0.5 ml.

Notes

Statement *re* reactions were asked for as at two days after the injection.

Severe reaction (+++) redness and/or swelling of entire upper arm.

Moderate reaction (++) area of redness and swelling more than three inches in diameter.

Slight reaction (+) area of redness more than one inch and less than three inches in diameter.

General reactions : Only one subject complained of general reactions—nausea, sweating, etc.

Dr. B. H. LEWIS,
Senior Medical Officer, Epidemiology Branch.

VENEREAL DISEASES

The year 1964 has been notable for the considerable arrest in the upward trend of notifications that has been evident over the past four years. The total number of notifications increased by only 13, this figure being almost compatible with the increase in the State's population. The number of reported cases of Gonorrhoea increased by 30, but the number of cases of Syphilis fell by over half to 11 for the year, this being the least number reported during any twelve month period since notifications commenced in 1916, apart from the three years, 1958–60.

The proportion of cases occurring among teenagers remains high at 26%, unfortunately having followed the trend observed in most other countries.

Table 1

VENEREAL DISEASE, W.A., 1953–1964

Year	Gonorrhoea	Syphilis (All Types)	Granuloma (Inguinale)	Chancroid	Venereal Disease (All Forms)
1953	189	43	2	1	235
1954	188	21	1	2	212
1955	188	14	1	....	203
1956	188	12	....	....	200
1957	213	14	1	....	228
1958	148	5	....	1	154
1959	72	8	....	1	81
1960	87	6	....	....	93
1961	119	17	....	....	136
1962	283	16	....	....	299
1963	362	28	....	....	390
1964	392	11	....	....	403
1953–1964	2,429	195	5	5	2,634

Table 2

Years	Age Groups					
	15–19	20–24	25–29	30–34	35 and over	Age not stated
	%	%	%	%	%	%
1958	6	24	26	20	23	1
1959	7	25	15	19	32	2
1960	18	19	9	13	29	12
1961	10	30	17	18	22	3
1962	18	32	15	11	20	4
1963	24	30	13	11	21	1
1964	26	30	15	9	18	2

Table 3

	Male				Female				Total			
	1961	1962	1963	1964	1961	1962	1963	1964	1961	1962	1963	1964
Syphilis—												
Primary	5	4	6	2	1	2	6	4	6	6	12	6
Secondary	1	2	1	1	1	....	5	1	2	2	6	2
Tertiary	6	5	2	1	3	2	4	1	9	7	6	2
Congenital	....	....	1	....	....	1	3	1	....	1	4	1
Total Syphilis	12	11	10	4	5	5	18	7	17	16	28	11
Gonorrhoea	109	223	287	329	10	60	75	63	119	283	362	392
Granuloma	....	....	....	....	....	....	....	....	....	....	....	....
Chancroid	....	....	....	....	....	....	....	....	....	....	....	....
Grand Total	121	234	297	333	15	65	93	70	136	299	390	403

Dr. R. ALLEN,
Medical Officer, Epidemiology Branch

TRACHOMA CONTROL

ANNUAL REPORT FOR 1964

During 1964 the Field Staff carried out their programme of diagnosis and treatment of Trachoma among the coloured population in the Northern Agricultural, Eastern Goldfields and Murchison area using the " Intermittent Local Therapy Regime."

As may be seen by the following tables. there was a considerable decrease in Trachoma activity among all age groups in 1964, but this was due mainly to the low incidence of the active form of the disease in the Eastern Goldfields area.

Table 1

1964	0–4 Years			5–9 Years			10–14 Years			Over 14 Years			Total		
Area	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.
Northern Agricultural	271	203	74·9	316	187	59·2	277	73	26·4	89	6	6·7	953	469	49·2
Eastern Goldfields	331	178	53·8	316	145	45·9	237	37	15·6	483	6	1·2	1,366	365	26·7
Murchison	241	161	66·8	246	139	56·5	160	34	21·25	17	3	17·6	664	337	50·8
Total	843	542	64·3	878	471	53·6	674	144	21·4	589	15	2·5	2,983	1,171	39·3

Table 2

	0–4 Years			5–9 Years			10–14 Years			Over 14 Years			Total		
Year	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.
1962	1,422	1,159	81·5	1,728	1,194	69·1	1,209	457	37·8	845	146	17·3	5,204	2,956	56·8
1963	718	493	68·7	679	405	59·6	414	114	27·5	192	15	7·8	2,003	1,027	51·3
1964	843	542	64·3	878	471	53·6	674	114	21·4	589	15	2·5	2,983	1,171	39·3

During the year, the Field Staff was increased from two trained nursing sisters to four, and this will enable a larger area of the State to be covered each year, so it should be possible to visit and treat all the main centres in the Southern Half of the State every eighteen months.

In the Kimberley division, two Trachoma sisters were attached to Hospitals with the aim of lessening the incidence of Trachoma in this area. One Sister resigned during the year, and the results shown in the following table are from the West Kimberleys.

Table 3

	Pre-School Age			School Age			Adults			Total		
	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.
West Kimberleys	533	380	71·3	1,207	490	40·6	946	92	9·7	2,686	962	35·8

During 1963 a clinical trial of the " Intermittent Local Therapy Regime " was carried out in certain South West areas of this State using Achromycin 1% Oily Suspension. This was fully described in the 1963 Annual Report, and it will be seen that, among 323 active cases followed up six months after cessation of treatment, 71.5% showed no evidence of Trachoma activity.

As the summer months are usually regarded as the main time of the year when re-infection may occur, it was decided to re-examine as many of the original cases as possible in May this year at the end of a long dry summer (ie., eleven months after treatment was completed.)

Of the 323 cases originally followed up, 281 were located and re-examined :—

	Active	Healed	Cure Rate
Original diagnosis, February, 1963	281	0	....
First Follow-up diagnosis, December, 1963	76	205	73·0%
Second Follow-up diagnosis, May, 1964	91	190	67·6%

Thus it may be seen that a total of 15 persons became re-infected during the summer months, and the cure rate eleven months after treatment, was 67·6% compared with 73·0% six months after treatment.

These results are encouraging and warrant the retention of this therapy regime as the basis of treatment for Trachoma in Western Australia.

Dr. R. ALLEN,
Medical Officer, Epidemiology Branch.

REPORT OF A MEDICAL VISIT TO THE WARBURTON RANGES MISSION

In May, 1964, the above Mission was visited by officers from the Epidemiology Branch, Tuberculosis Control Branch, Trachoma Unit and Infant Health Service.

This Mission was established in 1935 by the inter-denominational United Aborigines Mission Board, and is situated in the Southern region of the Gibson Desert, approximately 965 miles North East of Perth. At the time of the visit, the number of inhabitants was approximately 300, all of whom were contacted.

Before returning, Laverton, Cosmo Newbery Mission and Mt. Margaret Mission were also visited.

Work Done

(1) *Heaf Tests*

One hundred and eighty-six Heaf Tests were performed on behalf of the Director of Tuberculosis Control. However only 108 of these were available for reading.

Two Grade 3 reactions were seen, both in school age children, and were the only significant reactions noted.

(2) *X-rays*

A total of 471 Chest x-rays were taken and returned to the Tuberculosis Control Branch for processing and interpretation.

(3) *Infant Health*

Well-attended clinics were held at Laverton and Warburton Ranges.

(4) *Salk Vaccination*

Two hundred and forty-seven injections were given at the Warburton Range Mission. Sufficient vaccine was left for the hospital staff to give the second injections in four weeks time.

Forty-one injections were given at Cosmo Newbery Mission. Second injections will be carried out by the Mobile Unit when it visits Laverton during its normal itinerary in five weeks time.

(5) *Trachoma*

LAVERTON

	0–4 Years	5–9 Years	10–14 Years	Over 14 Years	Total
Examined	17	24	22	87	150
Active	10	17	4	2	33
Percentage Active	58·8%	70·8%	18·2%	2·3%	22·0%

Intermittent local therapy will be carried out by a Trachoma Field Team when it visits the area in three weeks.

WARBURTON RANGES

	0–4 Years	5–9 Years	10–14 Years	Over 14 Years	Total
Examined	60	54	40	138	292
Active	35	28	7	0	70
Percentage Active	58·3%	51·9%	17·5%	0%	24·0%

It would be impossible for the hospital staff to undertake intermittent local therapy here, but they will be administering full courses of Lederkyn to the active cases.

The impression was gained that the staff of the missions appreciated the conbined visit, as it entailed less overall disruption of their routine than would have been caused by separate visits from the various departmental branches concerned.

Dr. R. ALLEN,
Medical Officer, Epidemiology Branch.

Appendix V

Activities of the Infant and Pre-School Health Services

The several sections are dealt with below. There is a certain amount of overlapping between the sections and a considerable interchange of personnel.

(1) *Infant Health Clinics*

There are 68 main centres from which the sisters work, 40 in the city and 28 in the country and four caravans. There are 294 sub-centres. Most of these centres are buildings especially built and exclusively used for the purpose of Infant Health work. There are a few where the sister holds her clinic in a room especially equipped for her sole use in buildings used for other purposes, e.g., C.W.A. centres in the country. In both the metropolitan area and in the country there are a large number, however, of very inadequate temporary locations in which sisters hold clinics—C.W.A. Halls, Shire Halls etc. In the country there are also regular clinic sites at farms, houses and native reserves where the sisters work from their cars.

Wherever sisters are working, the majority of mothers are visited in hospital shortly after delivery of the baby. In the country and in the outer metropolitan areas the local sister does the visiting. In the metropolitan area we employ one sister (exclusively) for visiting the large maternity hospitals. However in all cases the initial home visit is done by the appropriate sister in the district. This initial contact with the mother is made by regular visiting of hospitals and is supplemented by distribution of birth notifications from midwives. These are sent out at frequent intervals to all sisters who are thus kept informed of the births in their areas.

TABLE 1

	1964	1963
Birth Notifications received	14,934	15,420
Births registered in this State	16,685	17,290
Gross Attendances	243,530	244,912
Individual Attendances	32,622	32,049
Home Visits	27,131	23,381
Telephone Consultations	10,149	10,178
Pre-School Individuals seen	12,028	11,231

It will be noted that a total of 32,622 individual babies were seen and 27,131 home visits were made. A surprising amount of telephone advice or consultation was carried out by the sisters, totalling 10,149 for the year. While the majority of the children seen were under the age of 12 months, there is a considerable rise in the attendance of pre-school children aged one to five years. About 37% of the total were in this age group. About one third of the sisters in the field have received special instruction and become qualified to deal with the problems of pre-school children. These sisters conduct regular pre-school clinics. In actual practice, most of the sisters deal with problems in pre-school children although they have not done the Pre-School Training Course. As Infant Mortality and Morbidity decline so the more complex problems —behaviour, emotional disturbances and the emphasis on discovering less obvious physical and mental defects, become more manifest.

It is therefore felt that expansion in this field of pre-school health should continue.

In addition to their work in the Centres, country Sisters also carry out a certain amount of teaching in Schools. In 1964 they gave 323 lectures.

The organisation, staffing and supervision of the Centres is undertaken by this Department. There is also a very loose and variable arrangement with local authorities and local committees concerning the building, maintenance and control of the Centres themselves. Outside the metropolitan region there is still a very considerable interest and contribution made by local committees. In some instances they take the full responsibility of maintenance of the centre and living quarters for the Sisters, which are frequently attached to a centre In others this has devolved upon the Local Authority But, in the majority, there is a tendency for the responsibility to be shared by the Committee and the Local Authority In the metropolitan area Committees, for all practical purposes, have disappeared although some remain Local Authorities take most of this responsibility.

In addition to the above mentioned responsibility most Local Authorities pay a small annual sum to the Government towards the cost of the service but this constitutes a very small proportion to the overall cost.

While it is highly desirable that local committees should continue to take an active interest in their own Centre it appears that eventually the responsibility will devolve upon the Local Authority in whose area the work is done.

In addition to the purely local committees which are concerned with the building and its operation there exist, in many areas, car committees or travelling centre committees Generally such a Committee consists of representatives from each of the Centres served by one Sister Each Committee owns a car, which the Sister operates, and receives a considerable subsidy for the running of this car (bought free of purchase tax). They sell it, as a rule, after two years operation, and maintenance costs very little. The profit made on car mileage has considerably reduced the financial burden on some of the Committees who manage to meet their minor commitments from these profits.

As always, in the country, it is difficult to maintain Staff and as a general rule new Sisters joining the Staff are required to serve at least two years in the country. However, it is gratifying to note that a considerable proportion, about two thirds, are happy to continue working in the country for considerably longer than this.

(2) *Correspondence Service*

This section is divided into two.

(1) The Correspondence Service to mothers who are out of reach of Centres and

(2) The Mothercraft and Fathercraft Correspondence Teaching of school children.

It is difficult, if not impossible, to estimate the overall effect of Infant Health Clinics on mothers, babies and the whole family. It is even more difficult to estimate the effectiveness or otherwise of the Correspondence Service. It is customary, in this report, to include a table which dissects the work done in this field. However, figures alone cannot convey the impression of an extremely efficient service to the mothers who live in areas where there are no Infant Health Centres. It is only possible to obtain impressions and, by personal contact with mothers, both past and present, it seems that they value this service very highly indeed. Use is made of voluntary helpers who undertake, in certain areas, to weigh babies and send reports of this measurement to the Correspondence Sisters. These sisters maintain a close and personal contact with the mothers by letter. This written contact is supplemented by annual or biannual visits to the areas, where as many of the mothers and babies as possible are seen. It is pertinent to mention here the increasing contact this section of the service has with the native people, both full bloods and part-native, who, literate or otherwise, do maintain some contact with the Sisters. It is a slow and laborious business to make and retain this contact especially with illiterate or semi-literate people, and a tribute must be paid to the devotion of the Sisters in the way in which they are slowly, but surely increasing their apparent effectiveness in this field.

In 1964, 2,043 letters were received and 7,906 letters were sent to mothers and 12 trips, generally by two Sisters on each occasion, were made into the country areas. Eventually, as population increases in the more distant areas, there will inevitably be a reduction in this part of the work but there is no sign of it occurring at the moment.

The second section of the Correspondence Service concerns *Mothercraft and Fathercraft.* Nine hundred and thirty-nine children were being taught this subject in 1964, and of these 858 were seen personally on country visits. This section also does a considerable amount of work in Headquarters and in 1964 gave 80 lectures and demonstrations to 3,118 people at Headquarters and in the country. In addition to these special country trips there were the routine four trips in the Tea and Sugar Train of the Commonwealth Railway, between Kalgoorlie and Pt. Augusta and return. The teaching of Mothercraft etc., to school children in the country is extensive and it is difficult to estimate its effectiveness. Opinions from school personnel, both teachers and superintendents who are intimately involved in this work, seem to indicate that it is very well worth while, not only in the direction of its specific objectives, but also as a means of promulgating Health Education in a very susceptible age group. Again, according to the Education Department Officers, it is important in general education. It is felt that this rather costly section of the work could well be supplemented by a grant from the Education Department. It is certainly in need of expansion as the demand for teaching in this field is increasing and Staff limitations, at the time of writing, precludes any increase.

(3) *Mothercraft and Parentcraft*

From four to five Sisters, during 1964, were employed in this section which is housed separately at a building in Ord Street, West Perth. These Sisters undertake work in three main sections :—

First, *Mothercraft Teaching.* This is given in High Schools, Private Schools, Perth Technical College and Perth Technical College for Trainee Teachers and Kindergarten Training College, also certain special groups such as Slow Learners, Home of the Good Shepherd, etc. In 1964, there were 111 classes taught, totalling 932 lectures and the number of pupils involved were 2,036. As mentioned above this Mothercraft teaching is also carried out by the country Sisters, and in 1964 there were 41 classes taught by these Sisters, 337 lectures given to a total of 664 pupils.

With alterations in the Curriculum of the High Schools it is likely that the pattern of Mothercraft Training may change in the near future. At the moment it is felt that it is rather unsatisfactory in that classes are by no means regular and do not involve all schools. They also do not involve all classes in the schools concerned. There is a tendency for the lower academic standard to be taught rather than the brighter pupils.

Commencing probably in 1966 a Course in Health Education will be taught to all the junior classes in High Schools and it is anticipated that the teaching of Mothercraft will probably be incorporated in this.

The second section of the work involves a large number of different groups, mostly small, ranging from Medical Students through Mothercraft Trainees to various Clubs and Organisations. A total of 36 classes were dealt with in this miscellaneous group with 97 lectures given to 457 individuals. A number of Television programmes and sound Broadcasts were also made.

Parentcraft Classes is the third major work of this group and regular evening classes for prospective mothers and fathers are held in various Centres. It is extended to mothers in certain daytime classes in Centres in the City and Suburbs. Thirty-five classes were held in 1964 involving 295 lectures to 792 people.

Considerable expansion is required and anticipated in the Parentcraft Teaching as these lectures are extremely popular, very well attended and present opportunities for Health Education in a particularly susceptible group. A certain amount of relieving work in Centres was carried out by these Sisters as well. For three of the four trips of the Tea and Sugar Train this Mothercraft group were involved. This work has now been transferred to the Correspondence Section.

(4) *Pre-School Health Care*

As mentioned above there are a number of sisters (about one third of the total) who run special Pre-school Clinics in the Infant Health Centres. This is in addition to the work done in this field by most of the Sisters incidental to their Infant Health work. There are also two other sections of this work at present under the control of Child Health. First the Pre-School Health Scheme which was inaugurated in 1962 in conjunction with the University Department of Child Health, and secondly the Kindergarten examinations. The *Pre-School Health Scheme* is voluntary, for those mothers who want it, whereby they are encouraged to make use of the Infant Health Centres and their own General Practitioners in routine examinations of their children ; initially at the age of six months, then at twelve months and finally in their fifth year. Each year more mothers join this scheme but unfortunately a considerable number drop off after the first examination.

Table 2 shows a result of a survey of this scheme carried out in 1964. Numbers involved in the fifth year are too small to be considered but they may rise considerably next year.

TABLE 2

Pre-School Health Scheme, 1964

Joined scheme and sent to family doctor	8,851
Cards returned by family doctor	7,636
Recorded as due for second visit	6,444
Seen by Sister and sent to doctor	3,629
Cards returned by doctor	3,122

The third form of Pre-School child care is the examination of children in Kindergartens and Child Minding Centres. This involves also an inspection of the Centres and advice to the Kindergartens, etc. Close liaison is maintained with both the Kindergarten Union and the Education Department. In 1964 a total of 4,418 children were examined, 1,358 in the country and 3,063 in the metropolitan area. A full-time medical practitioner and a sister are employed in this section and some assistance is given by country doctors in the more distant areas. Full medical examinations, including audiometry and tests for visual acuity, are carried out in these visits and this year 373 were referred to their own doctors for attention. The mothers are encouraged to attend at the time of these medical examinations and some advice is given to them at this time.

This highly expert service is of great value to those children who are fortunate enough to attend Kindergarten and it is felt that it is a great pity that all children could not undergo as rigorous and useful an examination. An expansion of the Pre-School Health Scheme with the co-operation of local and general practitioners should theoretically make this facility available, but at the moment there exists a divsion between the three Services—the ordinary Pre-School Clinics, the Pre-School Health Scheme and the Kindergarten Examination and every effort should be made to weld these three together as soon as possible.

THE PROBLEM OF NATIVE CHILDREN

The problem of the health of native children is in this State a very difficult one. Full-blood natives are excluded from the statistics and the number of these is not known ; nor is there any precise knowledge of the numbers of those classified as part-natives. However, it is known that a great majority of both native and part-native children are living in conditions very much below that of the majority of the rest of the community. The problem varies greatly in different parts of the State and it is fully realised that, overall, a great improvement in social and economic state is necessary before any really major improvement can be made in their health. It is felt, however, that perhaps some contribution to the overall picture of native health can be given by extending the Child Health Services.

The Correspondence Service, as has been mentioned above, does a considerable amount of effective work among mothers, babies and, particularly, among school children. Where Clinics exist in areas where there are concentrations of natives or part-natives, the mothers are encouraged to attend the Infant Health Centres, but the response, by and large, is very poor indeed. The sisters in these areas continually visit Native Reserves and native homes and attempt to encourage mothers to come to the Centres. If they do not attend they try to see them in their homes. This is time consuming, difficult work, but steady progress is being made and should be considerably expanded in the future.

Much work is being done by the already established sisters in Broome and Derby but a great deal more still has to be done, both there and in areas where there are no Infant Health Sisters.

Unfortunately no reliable figures are available regarding mortality or morbidity among these people but it is strongly suspected that both in the infants and pre-school children it is considerably higher than in the rest of the community. Attempts are being made to discover the extent of this problem but, by the nature of the methods of recording births, deaths and morbidity, only approximate data will be available. Deductions therefore have to be made on insufficient grounds.

In this field the work of the Infant Health Sisters is mainly one of Health Education. It is true that this, indeed, is a most important part of their work with all parents but with this particular group of the community the problems are different and very much greater. It would be foolish indeed to expect short term results in this field, but it is felt that a great deal of work can and should be done. But it must be realised it is going to be both expensive and not productive of immediate results. It certainly presents the most significant and important challenge to the Service. One only has to visit country hospitals in places where there are any number of native or part-native people to realise that their Children's Wards are filled with patients of native extraction out of all proportion to their numbers in the community. For example, at a recent survey of the Princess Margaret Hospital 20% of the patients were native or part-native. Much more preventive medicine is necessary and this, if effective, may well reduce the considerable cost of medical treatment of these people. This cost at present, it is understood, is mostly borne by the State. It must be repeated that Child Health, specifically, is only a single aspect of this multi-faceted problem, but it is one which should be seriously tackled.

VITAL STATISTICS

Over the past ten years there has been a fall in the birth rate (see Table 3).

TABLE 3

W.A. Birth Rate

Year	Metropolitan	Other	State
1954	22.38	27.9	24.89
1963	20.07	25.48	22.36
1964	18.82	24.29	21.11

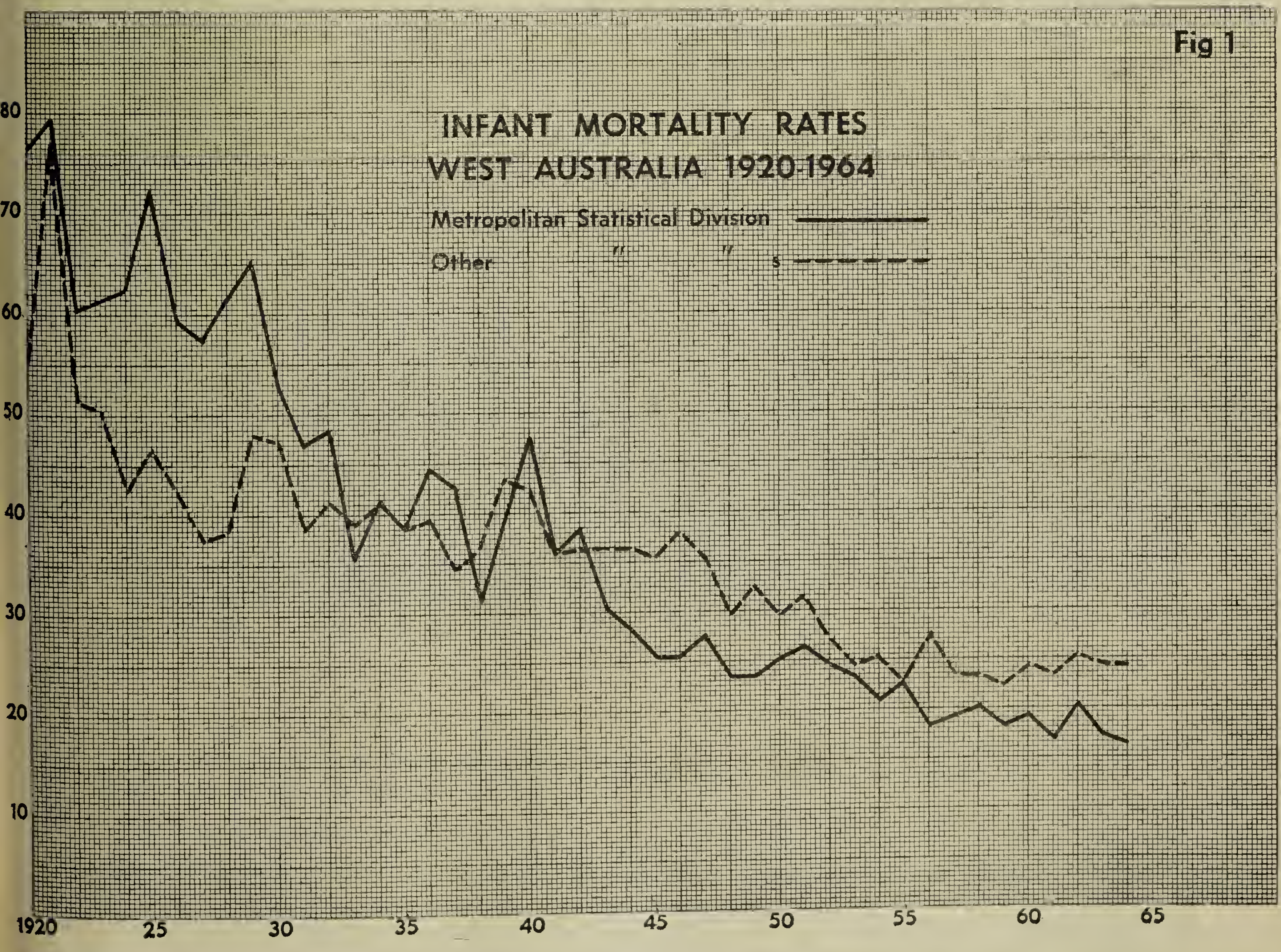
The fall in the metropolitan area and the other statistical divisions was approximately equal, but the birth rate remains considerably higher in the other statistical divisions. However, over these past ten years there has been a steady rise in the actual number of births ranging from 15,928 in 1954 to 17,290 in 1963. In 1964 there was a marked fall, the total births being 16,685, lower than they were eight years ago.

As in all places where there is a reasonably good infant mortality rate, there has been no marked fall in the last ten years, but there has been a fall from 22.54 per thousand live births in 1954 to 20.42 in 1963 and 19.66 for 1964. As is common in places with a small population, the fluctuations from year to year are considerable and it is better to look at a five or ten year period when assessing these figures.

A disturbing feature of the infant mortality rate is the consistent discrepancy between the rate in the metropolitan area and that in the other statistical divisions. In the last two decades only on one occasion (in 1955) did the " other " equal the metropolitan rate.

Figure 1 is a graph of the infant mortality rates in the " Metropolitan " and " Other " statistical divisions in Western Australia from 1920 to 1964. It will be noted that the rate tended to be higher in the metropolitan than it was in the other divisions until the mid thirties. But since 1940 the position appears to be reversed, the higher rate being consistently in the " Other " statistical divisions.

Fig 1



Examining the situation for the whole of Australia it is found that, by and large, the same condition tends to occur ; namely the infant mortality rate in the metropolitan division tends to be lower than that of the other statistical divisions. But comparing Western Australia with the other States this difference is consistently more marked in this State.

Figure 2 is a graph of the infant mortality rate in the " Other " statistical divisions for Australia as a whole and for " Other " statistical divisions in Western Australia from 1952 to 1964.

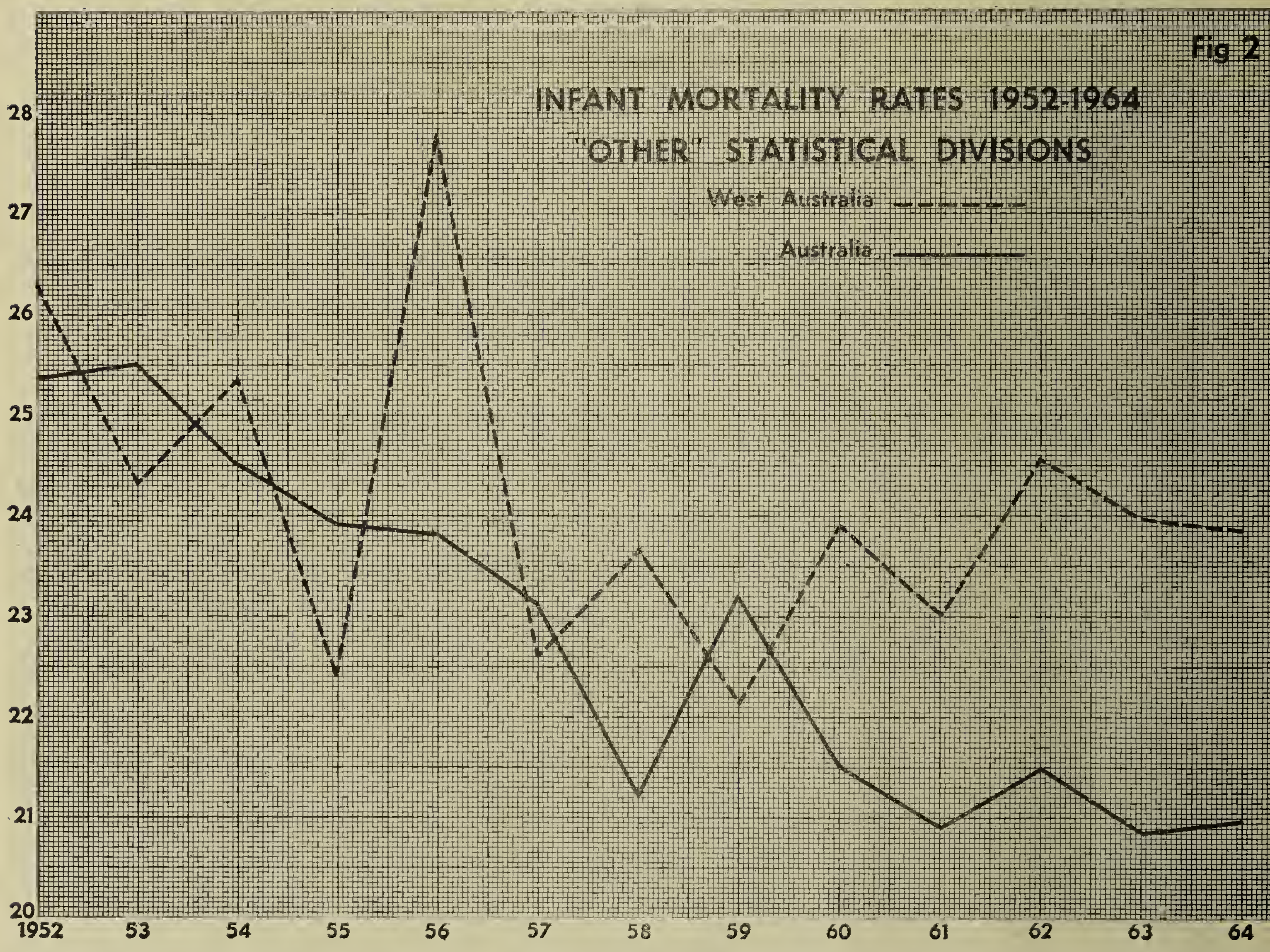


Fig 2

Figure 3 compares the rates for Metropolitan and Other statistical divisions in each of the Australian States from 1960 to 1964 inclusive. It will be noted that while the scatter is quite wide in the " Other ", the " Metropolitan " rates are much closer. Indeed, in Western Australia the metropolitan rate is, during the years surveyed, among the lowest ; but the W.A. rate in " Other " statistical divisions is, fairly consistently, the highest.

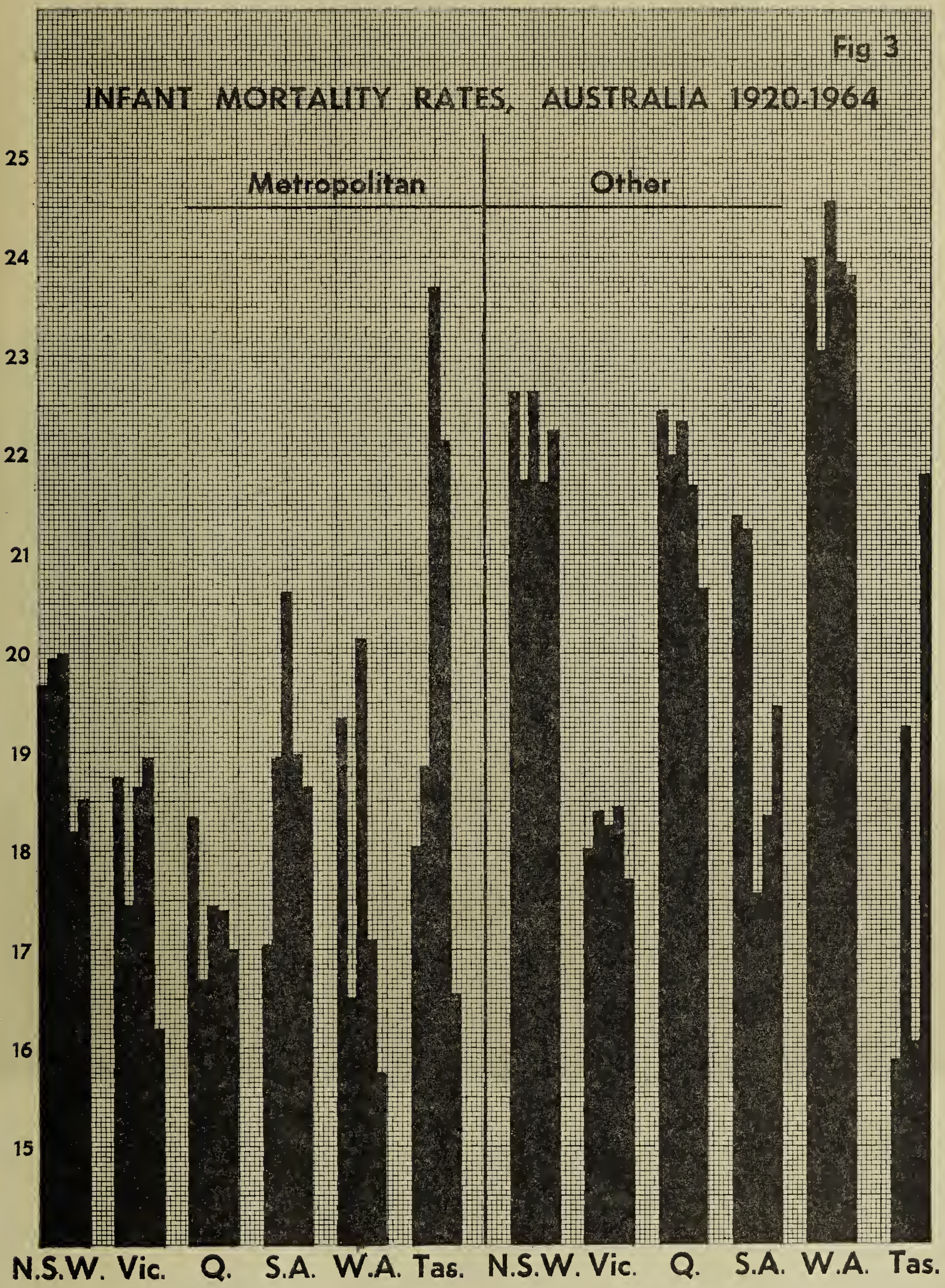


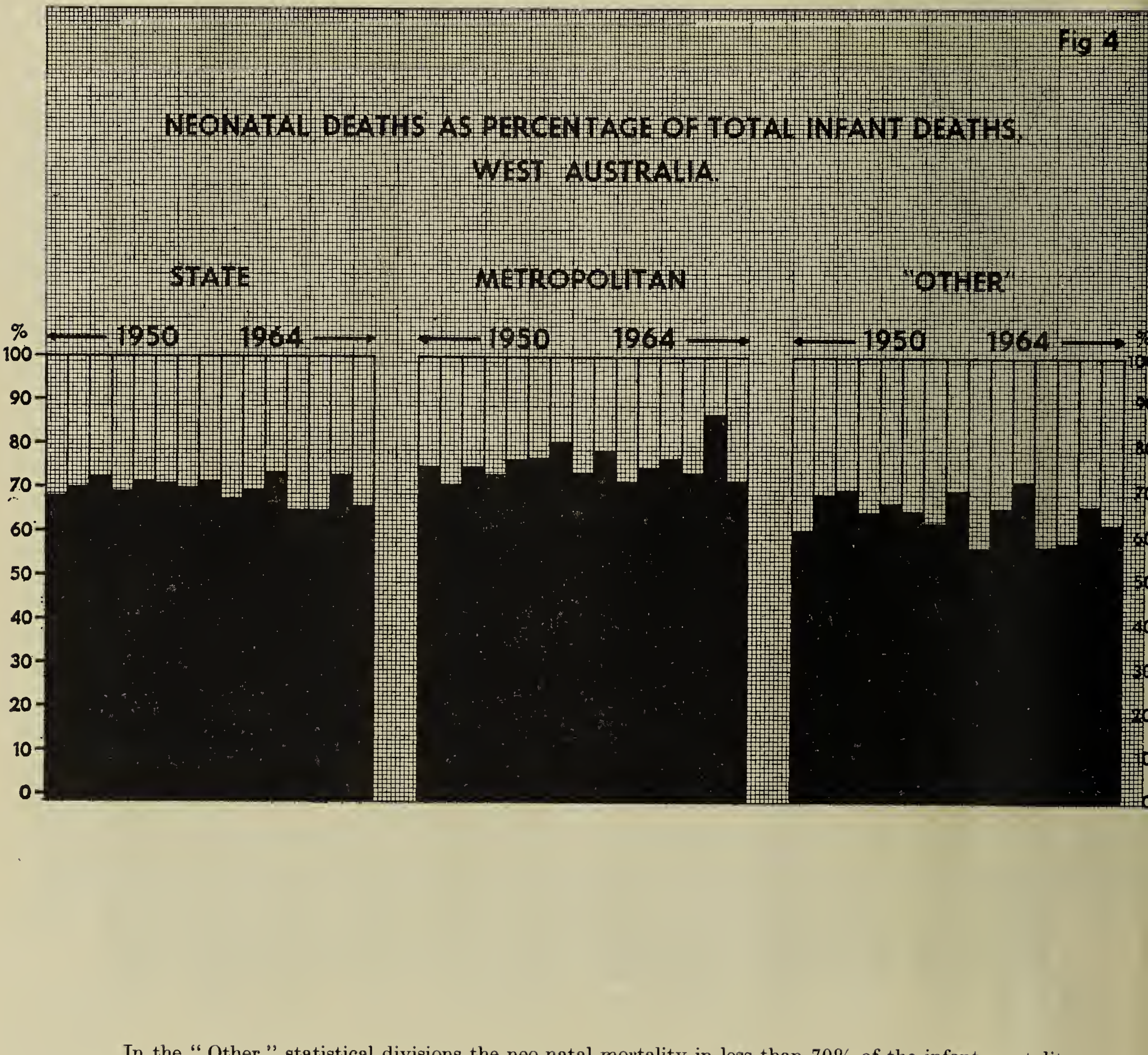
Fig 3

INFANT MORTALITY RATES, AUSTRALIA 1920-1964

The overall mortality rate is good and is falling ; but, while the country rate apparently stays much higher than the city, the situation in Western Australia leaves no room for complacency.

An interesting and probably significant measure of the state of health in a community, possibly a little more delicate than the straight infant mortality rate, is to examine the proportion of the neo-natal deaths as a percentage of the total infant deaths. After surviving the first hazardous four weeks of life the death rate in children for the subsequent eleven months should be low. At the present time it is considered that not more than 30% of the total infant deaths should occur after the first four weeks. Assuming this empirical figure, it is considered that, if the proportion of neo-natal deaths is *below* 70%, there is probably some defect in the care of children during the post neo-natal period.

Figure 4 shows the proportion of neo-natal deaths as a percentage of total infant deaths in Western Australia from 1950–1963. There are three graphs, the first is the State as a whole, the second the metropolitan statistical division and the third the other statistical divisions. It will be seen that, in each year, only in the metropolitan statistical division is the percentage of neo-natal deaths consistently at or above the empirical 70%.



In the " Other " statistical divisions the neo-natal mortality in less than 70% of the infant mortality in most years. On three occasions in the thirteen year period, 1958, 1961 and 1962 it was below 60%. This means that, outside the metropolitan area, more than 30% and on three occasions more than 40% of the infant deaths occur in the age group, four weeks to 12 months, when by world standard the upper acceptable limit is 30%. However good the metropolitan figures are (and they are very good indeed) the country rate indicates that we are losing too many babies between four weeks and one year.

An examination of the causes of deaths in the post neo-natal period in Western Australia for five years was undertaken and the results are shown in Table 4. This shows that 54% of the deaths in this period (1960–1964) were due to infections. In Australia as a whole for the year 1962 (the middle of this period) 48% of the post neo-natal deaths were ascribed to infection. In passing it was rather surprising to find that the high percentage of deaths due to accident in this period of life—11 for Western Australia and 10.2 for Australia as a whole.

Table 4

CAUSES OF POST NEO-NATAL DEATHS, WESTERN AUSTRALIA, 1960–1964

Year	Total	Infections	Malformations	Accidents	Other
1960	97	55	21	5	16
1961	118	69	24	10	15
1962	133	65	29	17	22
1963	96	57	17	6	16
1964	111	54	20	23	14
Total	555	300	111	61	83
Percentage	100	54	20	11	15
AUSTRALIA, 1962					
1962	1,351	650	349	138	214
Percentage	100	48	25·8	10·2	16

There appears, from these figures, to be a significant difference between the State of Western Australia and Australia as a whole, in the proportion of deaths due to infection in the post neo-natal period.

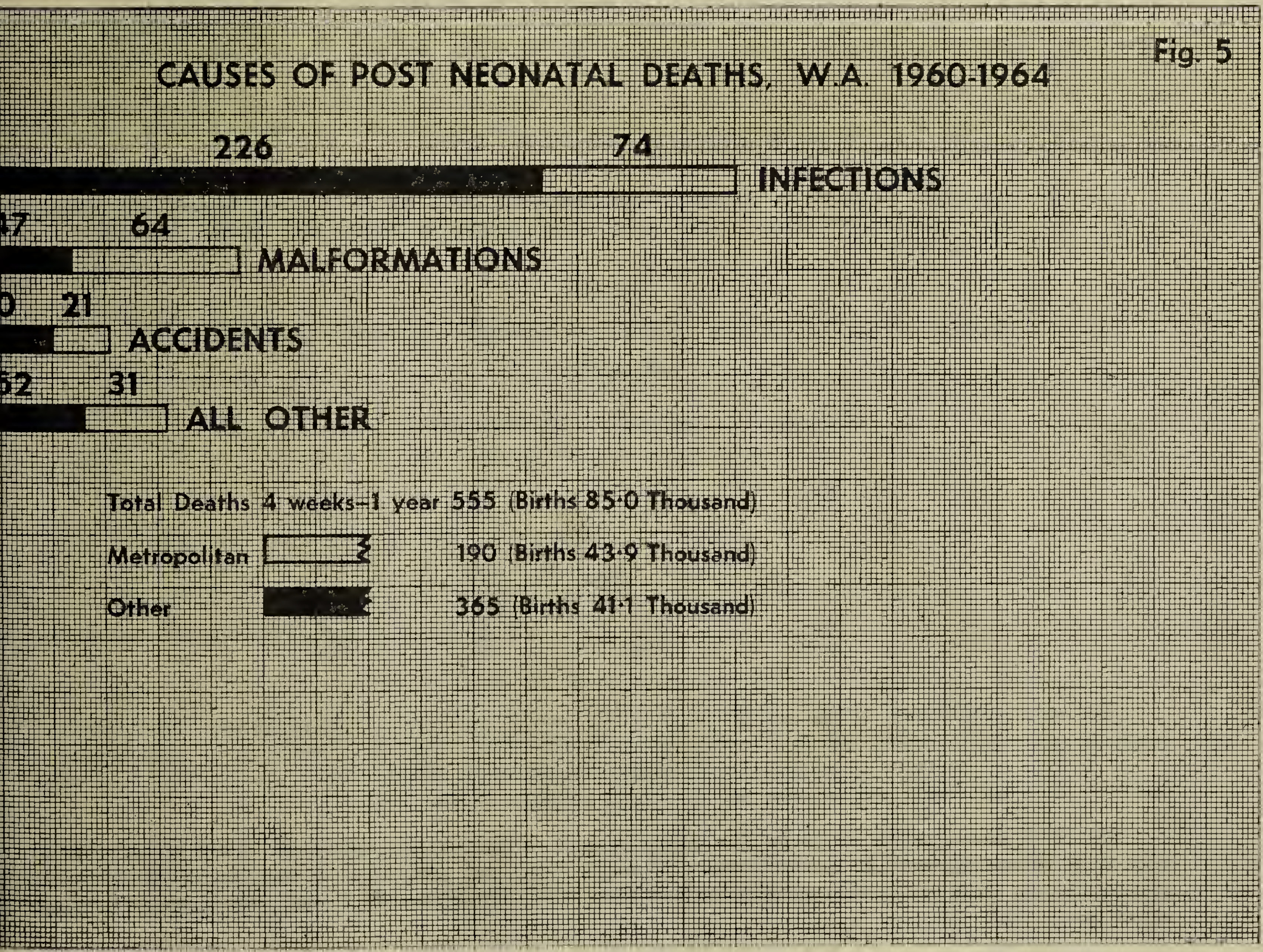
It was therefore decided to investigate the figures for metropolitan and other statistical areas in this regard with the following result :—

Neo-natal deaths (0–4 weeks) in the metropolitan and country areas showed no marked differences. Total deaths in the five year period (1960–1964) were—metropolitan 591, other 617. As to causes the usual proportion was maintained in both areas. The figures tend, it is felt, to demonstrate comparable standards in obstetric and neo-natal care in city and country.

However in the post neo-natal period, a different situation appears. As mentioned earlier in this report the deaths in the post neo-natal period are consistently higher in the other areas. In the period under review there were 190 deaths in the metropolitan area and 365 in the other (the usual residence is used in allocating these deaths wherever they might take place). Figure 5 is a representation of causes recorded for 1960–1964. It will be seen that, as might have been anticipated, the major differences occur in the number ascribed to infections. Here 226 of the 300 total deaths due to infection were allocated to the other statistical divisions. It is also worth noting that while 21 deaths were listed as accidental in the metropolitan area, there were 40 in the other statistical divisions.

Fig. 5

CAUSES OF POST NEONATAL DEATHS, W.A. 1960-1964



Another feature which calls for comment is the death rate in children between one and five. The latest world figures available, (which are mostly for 1961) show that, in most western countries with a reasonably high standard of living, this rate is around one per one thousand of the population in that age group. It tends to follow, fairly closely, the pattern of infant mortality—see Table 5.

Table 5

PRE-SCHOOL MORTALITY AND INFANT MORTALITY RATES

Country	Year	Mortality Rate 1–4 years per 1,000 of population in that age group	Infant Mortality Rate
United Kingdom (England and Wales)	1961	0·9	21·4
Sweden	1961	0·87	15·8
U.S.A.	1961	1·025	25·3
France	1961	1·14	27·4
Portugal	1961	9·25	88

The figures for Western Australia taking two five year periods are shown in Table 6.

Table 6

W.A. MORTALITY RATES 1–4 AGE GROUP PER 1,000 POPULATION

	Metropolitan Statistical Division	Other Statistical Division	Whole State
1952–56	1·03	1·88	1·47
1959–63	0·83	1·58	1·21

It appears that our State death rate in this age group, one to four, is significantly higher than the better world figures at the moment. Our metropolitan rate is excellent and compares favourably with any other country, but the death rate in this age group from the other statistical divisions is nearly twice that in the metropolitan division.

In summary, therefore, it could be said that the overall figures in infant mortality are reasonably satisfactory and falling in the expected manner. However, this is largely contributed to by the excellent figures obtained in the metropolitan area, figures which are very much better than most others quoted. This situation also obtains in the death rate in the pre-school period as far as the metropolitan figures are concerned, but so high is the rate in the area outside the metropolitan region, apparently, that the overall State figures are considerably higher than might be expected.

Table 7 shows causes of death in the age group one to four for Western Australia divided into metropolitan and other statistical divisions. Only three major groups of causes are shown, " Infections ", "Accident " and "All Other."

Table 7

CAUSES OF DEATH IN AGE GROUP 1–4, WESTERN AUSTRALIA, 1960–1964

Metropolitan

Infections	Accidents	All Other Causes	Total
44 30%	41 28%	61 42%	146 100%

Other

Infections	Accidents	All Other Causes	Total
97 39%	91 37%	59 24%	247 100%

(The mean population of the age group over the period 1959–1963, " Metropolitan " and " Other " divisions were—Metropolitan 33.8 thousand, Other Statistical Divisions 31.6 thousand (a ratio of 1.07 : 1.0). It will be noted that approximately the same relationship as this is borne by deaths from " all other causes ", 61 in the metropolitan area and 59 in the country, (1.03 : 1.0).)

The main discrepancies occur in two major groups—infections and accidents. The mortality from both these causes represent an unknown but probably a very small proportion of the numbers of infections and accidents. It is not unreasonable to assume that, when the death rate is high, the incidence of these afflictions is high also.

The approximate death rates from infection in this period, 1960–1964, was 0.26 in the metropolitan area and 0.62 per thousand in the " Other " statistical divisions. The approximate death rate for accidents per thousand was 0.24 in the metropolitan area and 0.57 in the " Other " statistical divisions.

If the morbidity rate for infections and accidents is of the same order as the death rate, it again means that the morbidity rate in the country is very much higher than it is in the city ; of the order of two and a half times.

Comment :

It must be realised that almost certainly the major reason for these discrepancies between metropolitan and other statistical divisions is that the density of population in the other statistical divisions is very low indeed. This makes the problems of preventive medicine generally difficult. Diagnosis and treatment of minor and major ills is an important factor in preventive medicine and this is much more efficient in more closely settled areas. There are other factors operating as well, but their relative significance is at present unknown. One of these is the presence of a considerable number of part aboriginals living under lower socio-economic conditions than most of the population. In all the statistics quoted above full-blooded aboriginals are excluded. This exclusion is done by a method which is open to doubt as to its efficacy, as is admitted by the Statistical Department who, together with the Native Welfare Department make the best attempt possible under the circumstances to exclude all full-bloods. However, part natives are not excluded and their numbers and their contribution to these figures is unknown.

It is felt, however, that the differences between metropolitan and country figures are sufficiently marked to suggest that investigation of this situation should be undertaken. It is also felt that considerable expansion of the present services to instruct and encourage the inhabitants in child care is necessary. But to improve on our present figures with the very large areas to be covered with a very thinly spread population the effort must be great, the number of personnel considerably increased and the cost correspondingly high. As suggested above, the only likely financial return which might occur to offset these costs would be a reduction in the expenditure on the treatment of individuals suffering from preventable disease.

R. EDMONDS,
Senior Medical Officer, Child Health Services.

References

(1) Statistical Registers of Western Australia, Part 1. Population and Vital Statistics. (1930–31 to 1963–64)

(2) Demography, Commonwealth of Australia, 1962.

(3) U.N. Demography, 1962.

(4) Commonwealth Bureau of Census and Statistic, Perth.

Appendix VI

School Medical Report

Many country schools are now up to date on a two year inspection schedule and all have been examined within three years.

A total number of 48,441 children were examined of whom 13,059 were in the country. The parents of 14,163 were notified of some defect or other including dental defects, 4,442 were referred for medical attention. Table II shows a good response by the parents in obtaining this medical attention.

A total number of 60,983 children were examined for pediculosis (Table III) and the number notified as infected was 277. Re-visits to ensure that effective treatment had been carried out brought the total number of heads inspected up to 105,413.

The general health and nutrition of the children remains good.

Table I

School Medical Service

EXAMINATION OF METROPOLITAN AND COUNTRY SCHOOLS, 1964

—	Number Examined	Number Notified	Number Referred for Medical Attention	Number Referred for Home Attention and Observation	Number Requiring Dental Attention	Skin Complaints		Nutrition			Eyes Medical Attention	Tonsils Medical Attention
						Number	Per cent.	3	Under 3	Over 3		
Metropolitan Schools												
Boys	18,364	5,380	1,511	1,550	3,240	....	....	17,118	317	929	....	....
Girls	17,018	4,698	1,378	1,023	3,030	....	....	15,380	405	1,233	....	....
Total	35,382	10,078	2,889	2,573	6,270	985	0·3	32,498	722	2,162	1,460	122
Country Schools												
Boys	6,559	2,040	768	702	778	....	....	6,149	139	271	....	....
Girls	6,500	6,500	785	660	781	....	....	5,852	153	495	....	....
Total	13,059	8,540	1,553	1,362	1,559	733	0·6	12,001	292	766	840	55
State Total												
Boys	24,923	7,420	2,279	2,252	4,018	....	....	23,267	456	1,200	....	....
Girls	23,518	6,743	2,163	1,683	3,811	....	....	21,232	558	1,728	....	....
Total	48,441	14,163	4,442	3,935	7,829	1,718	0·3	44,499	1,014	2,928	2,300	177

Table II

HOME VISITS BY SCHOOL NURSES, 1964

Total Visits *re* Medical Attention	Received Attention	Promised Attention	Disinterested	Out or Left District	Visit to Cases Referred for Home Attention	Parents Phoned or Called at Office
2,984	1,399	642	35	554	24	129

Country Areas : Visits made : Nil.

Table III

HYGIENE INSPECTIONS BY NURSES FOR PEDICULOSIS

	No. of Children Examined	Number Notified	Percentage
Metropolitan	48,623	158	·38
Country	12,360	119	.96
Total	60,983	277	·45

Including re-visits to above, a total number of 105,413 heads were examined or re-examined.

Appendix VII

School Dental Services

STAFF

We commenced the year with four vacancies in our establishment of 15.

During the year there were two retirements while four new appointments were made (all Bursar graduates). We therefore had two vacancies at the end of the year.

One of the retirements was that of Mr. A. G. McKenna, the first dentist to be appointed to the School Dental Service when it was inaugurated in 1926. His long and faithful service over these many years has had much to do in developing the Service as we know it today.

A retired dentist was once more engaged on a temporary basis and he worked for several months in the Kimberleys in order to relieve the pressure on the Derby dentist.

FIGURES FOR THE SCHOOL DENTAL SERVICE

Number of country schools visited	113
Number of metropolitan schools visited	4
Number of native missions visited	3
Number of orphanages visited	9
Number of children examined	9,669
Number of children treated	6,861
Number of children needing no treatment	2,119
Number of children who were to receive treatment by private dentists	160
Number of children whose parents ignored notices	529

Details of Treatment for Children

Silver amalgam fillings	11,530
Copper amalgam fillings	7
Cement fillings	113
Porcelain fillings	942
Silver nitrate treatments	643
Gold inlays	4
Pulp treatments	150
Prophylaxis	1,421
X-rays taken	34
Other conservative treatments	3,567
Extractions	6,721
Orthodontic appliances	45

North-West—the following work was done for people apart from children

Number of natives attended free of charge	240
Fillings for natives	39
Extractions for natives	309
Dentures	3
Denture repairs	2
Treatment for fractured jaws	2

Number of White free list patients (pensioners, missionaries, nursing Sisters, etc.)

Fillings for white free list patients	201
Extractions for white free list patients	67
Dentures for white free list patients	15
Denture repairs	30
Prophylaxis	34

Number of paying patients (Derby and Port Hedland districts)

Fillings for paying patients	744
Extractions	902
Dentures	76
Denture repairs	63
Gold inlays	17
Prophylaxis	62
Other treatments	197
Fees debited	£3,065 15s. 3d.

Opportunity was taken to have the Mobile Road Clinics and Aero-dental clinics of the Perth Dental Hospital treat the school children on our behalf at the towns visited by them.

Details of Treatment

Fillings and caries control	2,688
Extractions	821
Miscellaneous	313

Reimbursement of the cost of this treatment, amounting to £7,424 11s. 8d. was made to the Perth Dental Hospital.

E. J. TURNBULL,
Senior Dental Officer.

Appendix VIII

Report by the Principal Matron, Nursing Section

By Miss P. F. Lee

HOSPITAL STAFFING

In preparing this report I note my comments at the end of 1963, when I reported that country hospitals had, for the most part, maintained their nursing staff establishments during that year. Unfortunately the same cannot be said of 1964, and, trends point to the possibility that smaller hospitals may not, in the future, be able to obtain the nursing staff required to provide the service commensurate with the standard of facilities provided. The larger hospitals do not experience such difficulties and trained nurses are usually looking for positions in the Regional class hospital. There are exceptions of course, these usually being the hospitals in attractive districts. In fact, many recently trained nurses who are employed in country hospitals regret that there is no opportunity for the nurse trained in a metropolitan hospital to learn something of rural community nursing during basic training.

In spite of staff shortages it is fair to say that in few instances have the hospital services been curtailed and the standard of the nursing care has been maintained. That this is so, is a tribute to the nurses who work in seriously affected hospitals. It is also pleasing to know that many nurses speak appreciably of their country nursing experience and of the standard of facilities provided.

Hospitals Inspected

" C " Class	146
" A " Class	27
Midwifery	12
Country Hospitals	45
Total	230

Accompanied by the Department's Health Inspector, numerous inspections were made of properties being considered for conversion to " C " Class requirements. These are not included in the above number.

No new hospitals were opened this year, although in the case of several, additional beds have been approved.

Scholarships awarded for Post-Graduate study at the College of Nursing, Australia, 1964 :—

Nursing Administration Diploma—Mrs, C. Brown.

Ward Sister Diploma—Miss F. Curren, Fremantle Hospital.

Theatre Management and Teaching Diploma—Miss O. D. Hedeman, Fremantle Hospital.

All were successful in their examinations.

GOVERNMENT SCHOOL OF NURSING

The School under the administration of Miss E. E. Harler, Organiser of Nurse Training, and with Miss V. M. Hobbs as Principal Tutor, continues to function efficiently. The basic nursing programme has been widened as far as present circumstances allow.

Recruitment

A considerable amount of time is spent by the Organiser of Nursing Training in discussing nursing education with prospective applicants and their parents. These girls do not necessarily train under the departmental scheme but seek advice because the School is well-known. Many enquiries are answered by telephone and by correspondence. Miss Harler has given talks at " Career Nights " conducted by Apex at High Schools.

Affiliated Hospitals—Teaching Staff

Mr. T. W. Carran, Sr. Tutor Diploma, was appointed to the Kalgoorlie District Hospital in April.

Mr. H. E. Harris, Sr. Tutor Diploma, was transferred to the Northam District Hospital in January.

Miss E. Inkpen, Sr. Tutor Diploma, was appointed to the Geraldton District Hospital in January.

The School is indebted to the Matron and Staff of Repatriation General Hospital for the interest shown in the student nurses. Each group in the Preliminary Training School is given a period of observation each week during the duration of the School. There are four Preliminary Training Schools conducted each year. The nurses in their second year of training at the District Hospitals, Northam and Geraldton, are seconded to the Repatriation General Hospital for extra theatre experience.

Nursing Aide Training

The Bunbury District Hospital was registered as a Nursing Aide Training School at the beginning of the year, this bringing the total of hospitals registered to give this training to eight. During the year 209 Nursing Aides commenced training.

POST GRADUATE COURSES FOR NURSES

Rehabilitation Week for Trained Nurses Wishing to Return to Active Nursing

As last year, the facilities of the school residence and library and the services of the Principal Tutor were made available to the College of Nursing, Australia, W.A. State Committee, by the Minister for Health on two occasions—29th June to 3rd July and 30th November to 4th December. Again these courses have proved to be most valuable and resulted in a number of trained nurses returning to work in either whole or part-time capacity in city and country hospitals.

Residential Seminar for Graduate Nurses engaged in Ward or Departmental Administration

Similar facilities to the above were made available to the College of Nursing for the second part of a Residential Seminar from the 12th to the 23rd October. The generosity of the Minister in making facilities available to the State Committee of the College is greatly appreciated. The results benefit all hospitals.

NURSING BURSARIES

Bursaries Granted for Year	Number Granted	Bursary Completed		Withdrawals		Bursars Graduated and Still Nursing		Expected Number of Nurses Graduating During Year					Total	
		No.	%	No.	%	No.	%	1965	1966	1967	1968	1969	No.	%
1957 and 1957/58	67	3	4·5	57	81·5	7	14·0	....	....	....	....	....	....	....
1958 and 1958/59	52	1	1·9	34	65·4	17	32·7	....	....	....	....	....	....	....
1959 and 1959/60	60	1	1·8	28	46·6	28	46·6	3	....	....	....	....	3	5·0
1960 and 1960/61	73	....	....	28	38·3	10	13·7	25	10	....	....	....	35	47·9
1961 and 1961/62	64	....	....	18	27·9	....	....	4	42	....	....	....	45	70·3
1962 and 1962/63	66	....	....	13	19·7	....	....	....	4	49	....	....	53	83·0
1963 and 1963/64	51	....	....	11	21·5	....	....	....	....	....	40	....	40	80·1
1964 and 1964/65	83	....	....	9	10·8	....	....	....	....	....	1	73	74	86·7
Total	516	5	0·9	198	38·3	62	12·0	32	56	49	41	73	251	48·6

PHYLLIS F. LEE,
Principal Matron.

Appendix IX

Nurses' Registration Board

Commissioner of Public Health :

I submit herewith, a report on the activities of the Nurses' Registration Board for the year ended 31st December, 1964.

The Constitution of the Board—

Dr. W. S Davidson (*Chairman*)	Commissioner of Public Health—*Ex officio* member
Dr. A. S. Ellis	Director of Mental Health Services—*Ex officio* member.
Dr. L. E. LeSouef	Nominated by the Australian Medical Association—Medical Practitioner.
Dr. R. Nattrass	Nominated by the Australian Medical Association—Practising Obstetrician.
Miss P. F. Lee	Principal Matron Public Health—*Ex officio* member.
Mr. J. G. Williams	Nominated by the Minister for Education—Specialist in General Education.
Miss K. M. Johnson	Nominated by the Minister for Health—General Nurse.
Miss G. T. Sibert	Nominated by the Minister for Health—Midwifery and Infant Health Nurse.
Mrs. M. Green	Nominated by the Minister for Health—Mental Health and General Nurse.
Mr. J. K. Brett	Nominated by the Minister for Health—Tutor.
Miss O. E. Anstey	Elected by the Registered General Nurses—General Nurse.
Mr. W. T. Highet	Elected by the Registered Mental Health Nurses—Mental Nurse.
Miss B. Grant	Elected by the Registered Midwifery Nurses—Midwifery Nurse.

Officers

Miss D. H. Bailey	Education Officer (Nursing) Public Health Department.
Mr. R. O. Dee	Nursing Officer (Education), seconded to appointment 29th June, 1964.
Mr. J. L. Castle	Secretary, commenced 15th June, 1964.

There were 11 meetings of the Board, 14 meetings of the Education Committee and 13 meetings of the Working Committee.

The meetings of the Working Committee included :—

Four ordinary meetings.

Six meetings with Area Group Committees, *viz* :—

1. Maternal and Child Health.
2. Mental Health.
3. General Core Medical
4. General Core Surgical.
5. Public Health.
6. Other Education (informal discussion with—Mr Patterson, Acting Director of Technical Education ; Mr. J. Williams, Research Branch, Education Department ; Mr. Hollis, Adviser, Technical Education).

Two meetings with Matrons and Sister Tutors (R.A.N.F.) ; and a Plenary Session of Area Committees in September, 1964.

In October, 1964, Dr. D. D. Letham, Physician-in-Charge, Occupational Health, replaced Dr. J. Rowe as Chairman of the Working Committee.

Steps were taken to establish a Curriculum Builders Committee and these were nominated in November, 1964—*viz* :—

Miss M. E. Parkes	Principal Tutor, Royal Perth Hospital.
Miss V. M. Hobbs	Principal Tutor, Government School of Nursing.
Miss D. H. Bailey	Education Officer, Nurses' Registration Board.
Mr. J. Williams	Superintendent, Technical Education Division of the Education Department.

The Report on the Australasian Conference on Nursing Education (Interstate and New Zealand Nurses' Registration Board representatives, held in November, 1963) was published in February, 1964.

A further Conference of Representatives of Nursing Registration Authorities was held in Sydney in May, 1964.

Registrations

The following table sets out the number of initial registrations/enrolments effected during the year (the figures for 1963 in brackets), together with the source of the qualifications of the persons registered.

Division of Register	By Examination in This State		From Outside of W.A.		Total	
General Nurse	342	(349)	313	(311)	655	(660)
Childrens Nurse	....	(....)	3	(1)	3	(1)
Mental Health Nurse	19	(14)	8	(9)	27	(23)
Midwifery Nurse	117	(116)	117	(156)	234	(272)
Nursing Aide	167	(137)	31	(35)	198	(172)
Mothercraft Nurse	15	(16)	1	(1)	16	(17)
Dental Nurse	22	(11)	....	(....)	22	(11)
Tuberculosis Nurse	15	(14)	....	(2)	15	(16)
Infant Health Nurse	19	(18)	3	(4)	22	(22)
Total	716	(675)	476	(519)	1,192	(1,194)

Section II of the Nurses Registration Act—non-payment of re-registration fees. The following table sets out the number of persons whose name has been removed from the several divisions of the register under Section II (1) of the Act and those whose name has been restored to the several divisions of the Register under Section II (3) of the Act, during the twelve months ending 31st December, 1964. (Where a person's name has been removed from more than one division, each has been separately recorded).

Division of Register	Number Removed Section II(1)	Number Restored Section II(3)
General Nurses	736	245
Childrens Nurses	2	2
Infant Health Nurses	33	8
Mental Health Nurses	41	13
Midwifery Nurses	304	80
Tuberculosis Nurses	40	10
Mothercraft Nurses	27	1
Dental Nurses	5	....
Nursing Aides	149	14
Total	1,337 (a)	373 (b)

(a) The number of persons whose names were removed from one or more divisions of the register equals 983. (b) The number of persons whose names were restored to one or more divisions of the register equals 284.

The effect of this section is to remove from the register, persons who have failed to register for two consecutive years. It was hoped that this would remove those persons who had registered whilst in the State on short term appointments and to a large extent, this is being done. However, the number of applications to be restored to the register would indicate that a large number of persons permanently resident in Western Australia are also being affected.

Examinations

The Board conducted 23 sets of examinations, involving 938 candidates and 133 examiners.

These included the First Year examinations as hereunder, in addition to those numbers mentioned above.

Examination	Number of Candidates
First Year Professional Examination	202
First Year Mental Health Examination	26

The First Professional Examination ceased to be an external examination. It was made obligatory on Schools of Nursing to conduct, subject to the Board's supervision, an internal assessment of student nurses between the twelfth and fifteenth month of their training. This assessment to include a written examination paper, integrating first year subjects.

The Examination for the First Year Assessment commenced in June, 1964 and 131 candidates sat prior to the 31st December, 1964.

J. L. CASTLE,
Secretary, Nurses' Registration Board.

Appendix X

Division of Occupational Health

STAFF

Dr. J. C. McNulty was away on long service and study leave until 12th October. Following a course at the Royal Institute of Public Health and Hygiene, he obtained the Diploma of Industrial Health, Royal College of Surgeons, London ; and of the Society of Apothecaries, London.

Dr. D. D. Letham resumed duty in January following nine months' study leave during which he obtained a Diploma in Public Health from the School of Public Health and Tropical Hygiene, Sydney.

In December, Dr. H. H. Macey, M.Sc., Ph.D., A.R.C.S., F.Inst.P., F.Inst.F., F.Inst.Ceram., was appointed to the staff as Engineer, Air Pollution.

OCCUPATIONAL HAZARDS

1.—*The Pneumoconioses*

Follow-up chest x-rays were taken of employees at risk (in the occupations mentioned in the 1962 report) to silicosis and asbestosis. Employers are being encouraged to arrange for x-rays of new employees who will be exposed to these dusts.

No new cases of silicosis or of asbestosis were presented this year.

2.—*Noise*

The programme of hearing conservation undertaken by this Department in conjunction with the Ear, Nose and Throat consultant and the Commonwealth Acoustic Laboratory, was continued.

The major project for the year was the establishment of a hearing conservation programme in the Goldfields. In this, the co-operation of the Chamber of Mines, the Unions, and the general practitioners in Kalgoorlie was sought and obtained.

Noise levels underground and on the surface were taken by the Commonwealth Acoustic Laboratory. Commencing on the 8th September, Sister Wilkinson of this Division and Sister Flood from the Chest Clinic of Kalgoorlie, have been undertaking audiometry and the fitting of plugs.

In the metropolitan area, this Division has now established hearing conservation programmes in sixteen factories. Experience has shown that hearing conservation will not succeed unless an interested and informed person is constantly following up employees provided with ear protection. The Sister, Occupational Health, is fulfilling this role to the full capacity of the time which she has available. There is a need within industry for more such skilled people to undertake this type of work.

3.—*Dermatitis*

During this year, 34 cases of industrial dermatitis were notified and followed up by the consultant dermatologist and Sister, Occupational Health. As well, 37 other employees were interviewed because of skin conditions.

The Department, through the Sister, Occupational Health, is encouraging management to notify employees of visits undertaken by the Consultant Dermatologist. The value of this was demonstrated by his visit to the cement section of one factory. Here, 14 employees presented themselves to him with dermatitis. Only two were due to occupational causes. He was able to advise them all on obtaining appropriate medical attention, and on protective measures at work. By the end of the year, there was only an occasional sporadic complaint. This experience well demonstrates that some substances not only cause occupational dermatitis, but may aggravate dermatitis of independent origin, and that proper education of the employees involved can reduce this to a minimum.

4.—*Pesticides and Fumigants*

Pesticides

Respiratory Protective Equipment.—During the year, the Field Officer continued to check and advise on the handling of pesticides by commercial pest control firms. Special attention was given to the proper use and maintenance of respiratory protective equipment which is often treated in an offhand manner.

Organic Phosphate Compounds.—Though the pesticides most used by pest control firms are those in the chlorinated hydro carbon group, there has been a marked increase in the use of the organic phosphate pesticides. These, fortunately, are usually not of high toxicity. Cholinesterase tests on 13 operators exposed to organic phosphate compounds were within normal limits. Routine tests are being organised for the aerial spraying firms which use these compounds.

Arsenic.—Liquid solutions of arsenical compounds are now used almost soley for termite control. Urinary arsenic tests on 17 operators in this work showed a range of 0.00 to 0.25 p.p.m. ; there was no case of arsenic poisoning.

Sodium fluoracetate—" 1080 ".—In the 1962 Report, reference was made to a Company which prepares this compound for the Agriculture Department. The process is being carefully inspected by the Field Officer from this Department. Atmospheric concentrations have been consistently below 0.1 mg/c. metre. Respiratory protection is worn in the area where there is exposure to " 1080 ", before treatment to make it adhere to the grain.

" Serosan " (containing organically combined mercury 1.5%, mainly phenyl mercuric acetate ; gamma benzene hexachloride 0.5%).

During the year there were two cases of illness in men who had been exposed to " Serosan " dust during mechanical grading of grain seed treated with " Serosan." This operation in both cases was done in country areas where the grading equipment was fixed in relation to the shed in which the grain was stored ; so that at times the operators were forced to stand to the leeward side of the treated grain. The operation was done in hot conditions and sweating was profuse with much of the skin exposed to dust. One operator, with a urinary mercury of 0.07 p.p.m., five days after his last exposure to " Serosan ", had experienced generalised symptons which could be attributed to mercury poisoning. The other patient whose symptons included in-co-ordination and ataxia had a history of mercury poisoning. His urinary mercury level some days after exposure was 0·25 p.p.m. On the day of clinical examination approximately two weeks after exposure he was a-symptomatic and his clinical examination was negative.

Fumigants

Methyl Bromide.—Methyl bromide is gradually replacing other fumigants, including hydrogen cyanide, with the exception of the fumigation of bulk wheat. The Field Officer paid visits to flour mills and other premises to assess conditions prior to commencing the use of methyl bromide. He followed this up by tests for concentrations of residual methyl bromide.

Methyl bromide continues to be used extensively in nurseries and market gardens for the prevention of weed growth.

The Department has continued the practice of arranging for estimations of blood bromide (Conway's micro-diffusion method) on operators at a time when skin exposure to methyl bromide appears to be at a maximum. Since protective measures recommended by the Field Officer have been adopted, blood bromide concentrations have steadily dropped. All but two (3.6 m.g. and 2.5 m.g.) out of twenty, in the last two years, have been below 2.5 m.g./100 c.c. of blood.

"*Cyanogas*".—" Cyanogas " (calcium cyanide) is still used at the rate of 200 lb. per 100 tons of wheat for the fumigation of bulk wheat and storage. A large new new bulk wheat installation was checked this year for the liberation of hydrogen cyanide in the working areas. In only one area, over an endless belt (15 p.p.m.), did the concentration exceed 10 p.p.m.

5.—*Isocyanates*

Toluene Di-isocyanate (T.D.I.)

In the 1963 Annual Report, reference was made to the effects of T.D.I.

This year, two employees age 59 years and 55 years in a printing office had been subject to repeated attacks of asthma. In one man these were especially severe. Both had been exposed to T.D.I., in association with the process of adding it to urethane resin which had been heated in a metal pressure boiler. The patient with severe attacks had worked merely in the vicinity of the process before his first obvious exposure. This appeared to occur when he was cleaning out the pressure boiler after the resin T.D.I. mixture had been taken off through a hose into moulds. A subsequent test showed concentrations of .02–.04 p.p.m. of T.D.I. in the breathing zone of the operator doing the cleaning. Concentrations elsewhere were less than 0.01 p.p.m. The patient who had the more severe attacks, had no previous history of asthma ; but there was a family history of asthma ; the other had 18 years before a previous history of asthma over a period of three weeks.

6. *Lead*

Concentrations of lead were estimated in 106 specimens of urine from 84 employees exposed to lead. With the exception of two employees, the range was 0.01 to 0.19 p.p.m. Of the two exceptions, in one man, whose volume of urine was only 300 c.cs., the concentration was 0.24 p.p.m. Repeated three weeks later from a volume of 600 c.cs., the concentration was 0.10 p.p.m. The other man who works in a battery manufacturing factory showed an increase from one month to the next, from 0.16 to 0.28 p.p.m. He had no symptons or signs of lead poisoning. He was found to be a nail biter ; and was observed by a factory inspector to sweep dust containing lead oxide " from the table away from the exhaust ventilation." He has been taken off work in which he has been exposed to lead.

There was no case of lead poisoning.

THE WATERFRONT

First Aid Facilities.—As part of an Australia wide survey requested by the Occupational Health Committee of the Medical Research Council, the Physician-in-Charge visited the wharves at Bunbury. There, with Mr. W. Groom, Manager, Employers of Australia Waterside Labour, he inspected the first aid facilities and prepared a report for the Occupational Health Committee.

Respiratory Protective Equipment.—The Australian Employers of Waterside Labour agreed to a proposal that this Department should make a survey of respiratory equipment on the waterfront. This equipment is distributed over a number of stevedoring companies.

The Sister, Occupational Health, and Field Officer, visited the companies and inspected the equipment. This was found to be in good order, well maintained and properly cleaned. The Field Officer made a few recommendations concerning replacement of cartridges and canisters.

RESPIRATORY EQUIPMENT

The Department arranged for respiratory protective equipment to be tested by the Division of Occupational Health in New South Wales for compliance with the Australian Standard Z-18. Some equipment failed to comply with the standard. In these cases, distributing firms, when requested to do so by this Department, withdrew the faulty equipment from distribution.

During the year, the Health Act was amended to include section 338B which gives the Commissioner power to prohibit the sale, distribution or use of unsafe equipment such as faulty respirators.

AIR POLLUTION : CLEAN AIR BILL

A Clean Air Bill was prepared by this Department. Pending the passage of the Bill, the Minister for Health set up a Clean Air Interim Advisory Committee to advise him on technical aspects of air pollution and its control. There are seven members, two of whom were nominated by the Chamber of Manufacturers. The Physician-in-Charge Occupational Health is the Chairman. To this Committee the Air Pollution Committee of the Local Government relinquished its functions. During the year the Clean Air Interim Advisory Committee met three times. It considered and advised on problems such as the emission of dust from an alumina refinery and from a foundry ; and the erection of a new boilerhouse.

The Physician-in-Charge attended the second technical conference on Clean Air held in Melbourne on the 22nd-24th April, 1964.

The Minister for Health invited Dr. J. L. Sullivan, Chief Air Pollution Control Engineer, Division of Occupational Health, New South Wales, to visit this state to advise him on various aspects of air pollution. Dr. Sullivan was in Western Australia from the 2nd-8th September. He advised the Minister on current problems in air pollution. He emphasised the need to appoint to the Department a person of senior status for the control of air pollution. He should have expert knowledge and his experience should be adequate. Preferably he should be independent of any other section.

Following on this recommendation, Dr. H. H. Macey was appointed as Engineer, Air Pollution, to this Department.

EDUCATION

From this Division, lectures were given to fifth year medical students, safety officers, apprentices, health inspector students ; and St. John's first aid classes.

Addresses were given to First Aid Officers in industry, thc Instute of Personnel Management, a Sports Medicine Group, and Health Inspectors.

COMMITTEES

Committees on which representation of the Department came from this Division are :—

The Occupational Health Committee of the National Health Medical Research Council.
The Clean Air Interim Advisory Committee.
State Government Industrial Safety Committee.
Medical Advisory Committee of the Radiological Advisory Council.
The Working Committee (Nurse Education), Nurses Registration Board.
National Fitness Council.

ACKNOWLEDGMENTS

Co-operation with the Commonwealth Acoustic Laboratory in hearing conservation has been close and effective. The Government Chemical Laboratories have undertaken practically all of the chemical analyses. The Factories Branch of the Department of Labour has co-operated with this Division in a number of investigations.

The Ear, Nose and Throat Consultant, Dr. Dennis H. Clements, and the Consultant Dermatologist, Dr. T. C. Anthony, have continued to give valuable guidance and help in their specialities.

I appreciate the support which you as Commissioner of Public Health have given to the development of activities in this Division.

D. D. LETHAM, M.B., B.S., (Melb.), M.R.A.C.P., D.P.H.,
Physician-in-Charge, Occupational Health.

Appendix XI

Technical Information Service and Library

Technical information service and library statistics for 1964 and the four previous years are as follows :—

Items	1960	1961	1962	1963	1964
General—					
Non-journal publications received	575	778	999	856	727
Additional journals received	34	24	32	24	54
Total journals received	369	393	425	449	503
Average monthly journal routing	528	616	667	674	850
Borrowing (excludes routine journals)—					
From all other libraries	352	420	308	474	340
From W. A. libraries	343	380	268	429	280
From Medical Library of W.A.	248	295	193	310	179
From libraries outside W.A.	49	40	40	45	60
Lending (excludes routine journals)—					
All external loans	273	259	194	289	339
To Medical Library of W.A.	89	77	56	41	42
Number of organisations to whom loans made	27	21	24	24	24
Photocopies supplied	1,135	1,238	1,368	1,662	2,965

The number of books received into the library was smaller than last year but actual receipt is a rather uncertain measure since it may merely mean a delay in fulfilling outstanding orders. These 727 were sited as follows (figures for last year are given in brackets).

P.H.D. Library	398	(453)
Health Education Council	91	(99)
Public Health Laboratories	43	(55)
Hospitals	35	(N/A)
Nurses' Registration Board	34	(18)
Child Health Services	33	(12)
State X-ray Laboratory	34	(19)
Child Guidance Clinic	22	(23)
Government School of Nursing	19	(27)
Wooroloo	9	(N/A)
Chest Clinic	9	(6)
Total	727	

Journal loans, made outside the pattern of regular routing show the increasing value of the library. Such loans made in 1964 were : (figures in brackets being for 1963).

Gairdner Hospital	72	(15)
Medical Library	42	(41)
Department of Agriculture	36	(17)
Government Chemical Laboratories	31	(34)
University of W. A.	33	(0)
Royal Perth Hospital	33	(7)
State Library of W.A.	12	(17)
Princess Margaret Hospital	14	(8)
S.A. Institute of Medical and Veterinary Science	18	(0)
Mental Health Services Library	6	(4)
Main Roads Department Library	6	(0)
Hollywood Repatriation General Hospital	5	(0)
Education Department	4	(0)
Perth City Council	2	(0)
King Edward Memorial Hospital	2	(3)
Perth Dental Hospital	2	(25)
C.S.I.R.O. Regional Laboratory	2	(0)
Heidelberg Repatriation General Hospital	2	(0)
N.S.W. Department of Public Health	2	(0)
Institute of Agriculture	1	(0)
P.M.G. Engineering Library	1	(0)
W. A. Parliamentary Library	1	(0)
Individuals	10	
Total	339	

In addition to freely lending items from its growing periodical collection, the library also routes routinely its journals to and through other libraries. A total of 91 journals are supplied for this service to the following : (figures in brackets are for 1963).

Mental Health Services	19	(15)
Gairdner Hospital	12	(8)
Government Chemical Laboratories	10	(11)
Medical Library	10	(12)
Education Department	8	(0)
Department of Agriculture	6	(3)
Home Safety Division, National Safety Council	4	(0)
King Edward Memorial Hospital	4	(4)
School of Occupational Therapy	4	(3)
Perth Technical College	3	(0)
Perth City Council	3	(0)
Health Education Council	2	(13)
Royal Perth Hospital (Biochemistry)	1	(1)
School for the Deaf	1	(1)
Registrar-General's Department	1	(2)
Pre-Clinical Library	1	(1)
P & C Federation	1	(1)

Thus about 18% of the periodical material being received in the library is immediately and routinely made available to sources outside the Department. This may be considered as more truly a part of the Technical Information Service since this functions not mainly to answer questions but actually to take information out to the worker.

But besides lending our journals for routing we also borrow from others for our internal routing. The number of journals involved is 24, 22 of these being from the Medical Library and one each from the University and Government Chemical Laboratories.

In other ways too we received considerable help from others during the year, borrowing a total ot 340 items, 280 being from other West Australian libraries while 60 came from other States.

Material for permanent retention was also received from surplus disposal and library exchange services. To those organisations from whom material was received go our warmest thanks.

There are very interesting prospects ahead relative to the Technical Information Service and Library. New accommodation about mid-1965 is likely ; there is every prospect of Fremantle Hospital reviving a moribund library and also of the Mental Health Services beginning to develop the kind of psychiatric reference source that the library system in this State has long needed.

Procedures are being developed to record the work involved in the Technical Information Service. All of the statistics quoted here are for the library alone and do not indicate in any way the " extension work " of the Technical Information Service. It is hoped to have these in operation by the end of 1965.

JOHN F. WOOLCOTT, M.B., Ch.B.,
Chief, Technical Information Service and Library.

Appendix XII

State X-ray Laboratory

ANNUAL REPORT FOR 1964

To the Commissioner of Public Health :

Introduction

The State X-ray Laboratory consists of a Medical Physics and an Engineering Division. This report is concerned with the Medical Physics Division which is responsible to the Radiological Advisory Council for the administration of the Radioactive Substances Act and for the provision of Radiation Protection and Medical Physics Service.

1. RADIOACTIVE SUBSTANCES ACT

X-ray apparatus used by a medical practitioner or dentist solely for radiography of human beings is required to be registered. Users of fluoroscopic and other X-ray apparatus and radioactive substances are required to be licenced.

Registration is not subject to annual renewal and no fee is payable. Prior to 1964 the Act made no provision for conditions to be attached to a registration, nor for cancellation of registration.

In 1964 the Act was amended so that :—

(a) conditions may be imposed on a registration ;
(b) a registration may be cancelled by the Minister ;
(c) a penalty could be imposed for use of unregistered apparatus.

The following are details of licences and registrations for 1964 :—

Licences current at 31st December, 1964	148
New licence applications received	9
New licences granted	8
Licences terminated	2
Licences renewed—	
(a) Medical	114
(b) Non-medical	31
Registration applications at 31st December, 1964—	
(a) Dental Surgeons	123
(b) Medical Practitioners	42
Registrations approved—	
Dental Surgeons	8

Licences are granted by the Minister for Health who is advised by the Radiological Advisory Council. Registration of X-ray apparatus is effected by the Council. The Council is advised in special areas of Medicine, Dentistry and industry by advisory sub-committees.

Meetings were held during 1964 as follows :—

Radiological Advisory Council	5
Medical Advisory Sub-Committee	5
Dental Advisory Sub-Committee	1
Industrial Advisory Sub-Committee	0

The Laboratory provides the technical services necessary for the administration of the Act. These are referred to in other parts of this report.

2. LABORATORY SERVICES

(a) *Film Badge Monitoring Service*

The regulations require that all persons exposed to radiation must wear film badges. The film badge service conducted by the State X-ray Laboratory was established in 1957 and is used by the majority of radiation workers in the State.

In 1964, 8,277 personnel monitoring films were processed and the doses evaluated. This represents an increase of 37% over the figure for 1963. The increase has resulted largely from improved compliance with the regulations. The number of persons monitored at 31st December was 560, an increase of 24%. This number was made up as follows :—

Medical, Hospitals, etc.	154
Medical, Private Practice	41
Medical, Radiologists	40
Medical, Chiropractors	7
Dental	262
Non-Medical	56

Cumulative dose records are maintained for all persons regularly exposed to radiation.

(b) *Radiation Protection Services*

The Laboratory provides a design service for radiation protection. This applies to X-ray installations and to the use of radioactive substances. In the latter case protection is not necessarily the primary consideration, since in tracer studies the prevention of contamination of the experimental facilities may be the vital consideration.

During the six months ending 31st December, 1964 five designs were completed or are continuing. Frequent requests for advice on radiation hazards, design of protective equipment, were dealt with during the year.

(c) *Inspection Services*

There is a continuing program of inspection of installations of new applicants for licences and registration, and of re-inspection of those already licenced and registered.

Lack of staff has not permitted re-inspection to be carried out as frequently as desirable. The emphasis in the six months ending 31st December, 1964 was placed on the inspection of dental installations in both city and country.

Number of installations inspected July-December, 1964 :—

Dental	30
General Practitioners	4
Industrial	2

Some installations are visited more than once, either for follow up purposes or to provide technical advice. In addition 10 inspections of a minor nature or inquiring into a specific matter were made during the period.

(d) *Radiation Standards*

The Laboratory's sub-standard X-ray dosemeter is used for the calibration of radiation survey equipment and for calibration of superficial therapy X-ray equipment. Five of the latter calibrations were carried out during 1964.

A second dosemeter was calibrated against the Australian primary standard at the Commonwealth X-ray and Radium Laboratory for X-rays up to 2.5 mm Copper half value layer, and at the Royal Adelaide Hospital for four MeV X-Rays and Cobalt-60 gamma rays.

A set of calibrated radioactive sources were received during the year. These are divided into two categories :—

(1) for calibration of equipment used for measurement of radioactivity, and ;
(2) for calibration of survey equipment and monitoring films.

(e) *Measurement of Radioactivity*

Initial deliveries of equipment for the measurement of radioactivity were received towards the end of 1964. Further deliveries to complete the first stage of this equipment are expected early in 1965.

(f) *Medical Physics Services*

This service was not developed during 1964 due to lack of staff time. As far as possible, minor requests have been met.

(g) *Staff*

At 31st December the Physics Division was staffed by three full time officers, assisted by a part-time inspector. An additional position was created in November, 1964 and advertised throughout Australia. An appointment has been made and the position will be taken up in January, 1965.

(h) *General*

Lectures.—Lectures were given to the following organisations in 1963 :—

Seminar of the Society of X-Ray Technology and the Australian Institute of Radiography :
" Radiation Measurement "
Conference of Hospital Administrators :
" Radiation Protection "
V.H.F. Group :
" High Energy Accelerators "

Meetings.—Australian Dental Association Congress : Display on Radiation Protection in Dentistry.

Civil Defence.—Laboratory personnel continue to assist the Civil Defence Organisation by lecturing on Radiological Aspects of Civil Defence.

B. E. KING,
Physicist-in-Charge, Physics Division, State X-Ray Laboratory.

Appendix XIII

Report of Maternal Mortality Committee of Western Australia for the Year 1964

During the year 1964 there were seven maternal deaths in Western Australia, one of which was a non-obstetric death, thus reducing the figure to six. The total number of live births was 16,685 making a Maternal Mortality Rate for the the year of 0.36 per 1,000 live births.

The causes of these deaths are shown in the following table :—

Table No. 1

MATERNAL MORTALITY IN WESTERN AUSTRALIA, 1964

Case No.	Cause of Death	International List No.
1	Abortion, Medically Induced	650–1
*2	Acute Interstitial Pneumonitis	492
3	Delivery Complicated by Placenta Praevia	670
4	Puerperal Eclampsia	685
5	Puerperal Pulmonary Embolism	682
6	Abortion with Sepsis, Induced	651–2
7	Abortion, Self-induced	650–2

Maternal Mortality Rate equals 0.36 per 1,000 live births. * Non-obstetric Death.

The following are brief summaries of the above cases :—

Abortion : There were three deaths due to abortion, all of them avoidable.

Case No. 1. This was a case where therapeutic abortion was undertaken for a psychiatric indication. During the operation the uterus was injured and the Committee found that death was due to haemorrhage and shock following rupture of the uterus. (International List No. 650–1, Abortion without Sepsis or Toxaemia, Medically Induced).

Case No. 6. This was a multigravida with eight living children. Death was due to abortion, with sepsis, criminally induced either by the patient herself or by a person unknown. The patient was already in a state of bacteraemic shock when she came under medical care. At autopsy placental remains were found in the uterine cavity and Clostridium Welchii was cultured from the uterus and the blood. (International List No. 651–2, Abortion with Sepsis, Criminally Induced).

Case No. 7. In this instance the patient died from air embolism whilst carrying out a self-induced abortion (International List No. 650–2, Abortion without Sepsis or Toxaemia, Self-Induced).

Delivery Complicated by Placenta Praevia :

Case No. 3. The probable presence of a placenta praevia in this case was diagnosed and the patient was admitted to hospital for expectant treatment. Intermittent bleeding continued, however, and eventually Caesarean Section was performed. There was considerable bleeding at the operation and transfusion was insufficient to save the patient, already weakened by previous haemorrhage. This death was regarded as an avoidable one. (International List No. 670, Delivery Complicated by Placenta Praevia).

Puerperal Pulmonary Embolism :

Case No. 5. This patient was a multipara who had an apparently normal puerperium, but developed a mild phlebitis of the left leg on the tenth day. Three days later she died from a pulmonary embolism which was confirmed at autopsy. This was classified as an unavoidable death. (International List No. 684, Pueperral Pulmonary Embolism, associated with No. 682, Puerperal Phlebitis and Thrombosis).

Puerperal Eclampsia : Puerperal Pulmonary Embolism :

Case No. 4. In this patient a very mild toxaemia of pregnancy was noted and appropriately treated shortly before she came to term. Delivery was normal, but soon after labour was completed the blood pressure rose and a few hours later the patient commenced to have eclamptic convulsions, 23 of which occurred during the 24 hours following delivery. After an initial improvement she collapsed on the fourth day and died in a comatose condition on the thirteenth day after delivery. Postmortem examination showed evidence of recent cellular disturbance in the liver and a pulmonary embolism. This death was classified as unavoidable (International List No. 685, Puerperal Eclampsia, associated with 684, Puerperal Pulmonary Embolism).

Non-Obstetric Death :

There was one other death which was classified as a non-obstetric death due to Acute Interstitial Pneumonitis. This was not included in the calculation of the Maternal Mortality Rate. The case summary is as follows :—

Case No. 2. This patient, a young primigravida, was admitted to hospital a week before term on account of a mild toxaemia of pregnancy. Shortly after admission it became realised that the patient was developing a virulent form of pulmonary infection. This rapidly dominated the picture, and an X-ray examination showed bilateral consolidation of the bases of both lungs. In spite of intensive treatment by both medical and obstetrical specialists the condition rapidly deteriorated and the patient died less than 72 hours after admission. Autopsy revealed Acute Interstitial Pneumonitis as the cause of death. (International List No. 492).

Avoidability of Deaths

After full consideration had been given to all information regarding the above cases, it was decided that four of the deaths were avoidable (Cases Nos. 1, 3, 6, and 7). The remaining three cases were classified as unavoidable.

Avoidable factors included faulty antenatal care or faulty operative procedures (on the part of the doctor), as well as patient responsibility in two of the cases of abortion.

Results of Past Four Years

It might be opportune to summarise the work of the Maternal Mortality Committee during the first four years of its operation.

During this period a total of 24 Maternal Deaths have been fully investigated. Full clinical information was obtained by the investigator in almost all of the cases, notable exceptions being one or two of the cases of abortion with sepsis, and an abortion complicated by air embolism. In all but one of the 24 cases autopsy examination was carried out.

In Table 2 the Causes of Death are tabulated according to whether the cause was essentially an obstetric one (21 cases) or a non-obstetric one (three cases).

Table No. 2

SUMMARY OF CASES OF MATERNAL DEATH INVESTIGATED DURING THE YEARS 1961–1965

International List No.	Obstetrical Causes	Number of Cases
645–0	Ruptured Ectopic Pregnancy	1
650–1	Abortion, Therapeutic with Rupture of Uterus	1
650–2	Abortion, Self-Induced with Air Embolism	1
651–2	Abortion, Septic (Tetanus, Pseudomonas, Welchii)	3
651–3	Abortion, Septic (with sudden death ? Pulmonary Embolism)	1
670	Placenta Praevia	1
671	Manual Removal of Placenta (Associated with Death Under Anaesthesia)	2
674	Difficult Breech Delivery (Associated with Death Under Anaesthesia)	1
676	Repair of Lacerated Perineum (Associated with Death Under Anaesthesia)	1
677	Rupture of Uterus	1
678	Amniotic Fluid Embolism	2
681	Puerperal Sepsis	3
684	Puerperal Pulmonary Embolism	1
685	Puerperal Eclampsia	2
	Total	21
	Non-Obstetric Causes	
443.9	Chronic Myocardial Degeneration	1
045.0	Bacillary Dysentery	1
492.9	Acute Interstitial Pneumonitis	1
	Total	3
	Grand Total	24

Average Maternal Mortality Rate from Obstetrical Causes, 1961–1964 = 0.31 per 1,000 live births.

It is of interest that, of the 24 patients listed above, three were full-blooded aborigines and two were part aborigine. Furthermore six of the 24 pregnancies were illegitimate.

Another point which stands out in the above table is the fact that death under general anaesthesia occurred in one of every six cases listed. This highlights the dangers of general anaesthesia in the ever diminishing numbers of obstetric deaths.

EDUCATIONAL VALUE OF THE ENQUIRIES

When the Maternal Mortality Committee was established in 1960, one of the functions which was stressed was the educational value of the investigations. It was envisaged that this would apply, not only to those who were directly concerned with the occurrence of a maternal death, but also in the post-graduate training of medical practitioners as well as in the instruction of medical students, nurses and trainee nurses, for their assistance and guidance in avoiding and preventing maternal morbidity and mortality. It is unnecessary to state that, when case reports are used for teaching purposes, all reasonable steps are taken to prevent disclosure or identification of the individuals concerned in the report.

The educational value of these enquiries has been amply demonstrated during the four years that have passed since the Committec was established. Numerous opportunities have been taken of passing on the lessons to be learned from the cases detailed in Table No. 2 to both graduate and undergraduate audiences. Furthermore, four brochures have been prepared for circulation to members of the medical profession in Western Australia on particular problems arising out of the case studies. Brochures have been written on the following subjects and distributed to practitioners through the favour of the editor of the A.M.A. Bulletin of Western Australia :—

1. Puerperal and post-abortal infection.
2. The danger of using ergometrine in the presence of severe hypertension.
3. Anaesthesia in obstetrical cases.
4. The value of auto-haemo-transfusion in the emergency treatment of ruptured ectopic pregnancy.

In these and in other ways it is felt that the Maternal Mortality Committee has justified its establishment and has it within its power to make a substantial contribution to the diminution of the causes of maternal death in Western Australia.

The thanks of the Committee are due to the practitioners, obstetricians, physicians, pathologists, and others whose co-operation has made the investigations possible.

GORDON KING,
Chairman, Maternal Mortality Committee.

Appendix XIV

Report of the General and Meat Inspection Branch for 1964

GENERAL SANITATION REPORT

The many and varied duties performed by the General Inspection staff during the year 1964 were considerably curtailed by the provision of insufficient trained staff. However, it is gratifying to report that it is to the credit of all Officers concerned that further marked progress was attained, and amicable and co-operative liaison continued to flourish between Local Authorities, the Public Health Department and their respective officers.

It is with extreme regret that the passing of our esteemed colleague, Mr. P. A. Peirce, was recorded during this year.

Mr. W. O. Cornwell was transferred from the Meat Inspection staff to fill the above position.

The retirement of Mr. L. H. G. Worsam, Senior Inspector, Meat Inspection and Public Buildings, occurred late in the year, necessitating the inclusion of a record of the Meat Inspection activities in this report.

The year's main activities concerned the following items :—

1. Rubbish Collection and Disposal.
2. Inspections of sub-divisions of land intended for housing purposes.
3. Royal Show Activities.
4. Fly Control.
5. Mosquito Control.
6. Pest Control.
7. Routine inspections—including Country Towns, complaints, appeals to Commissioner of Public Health, approval of septic tank plans and food and water sampling.
8. Experimental Projects.
9. Meat Inspection.

Relevant figures and details concerning each of the above items, are submitted hereunder.

1. RUBBISH DISPOSAL

Co-operation between the Local Authorities and the Public Health Department in this field was again evident. Examples of the results of this policy continue to appear throughout the Metropolitan Area.

A summary of the year's activities is shown hereunder :—

METROPOLITAN REFUSE DISPOSAL PLANNING COMMITTEE

Summary of Accomplishment of Committee's Aims for Year 1964

From its inception the Metropolitan Refuse Disposal Planning Committee and its associated Zone Committees has maintained a marked degree of success in attaining and furthering the aims and objects established at the inaugural meeting held in July, 1958.

The year 1964 has not been an exception, and is noteworthy for the number of planning aspects, introduced by the Central Committee and successfully implemented by the respective Zone committees.

These aspects may be summarised as follows :—

(a) Completion of " GARBAG TRIAL ", City of South Perth, and distribution of report.

(b) Establishment of a site for receipt of derelict car bodies : Pre-organisation for introduction of Collection Service.

(c) Completion of organisation with Australian Paper Manufacturers for introduction of waste paper salvage. Trial area in Melville, East Fremantle, Cockburn and Fremantle area to commence operation April, 1965.

(d) Completion of organisation within Zones, for control of liquid waste disposal.

(e) Preparation of necessary Model By-laws :—

  11A. *re* Liquid waste disposal.

  12B. Permitting use of paper sack refuse receptacles.

(f) Extension of use of compactor type refuse collection vehicles : Evans Bros. unit purchased by City of Perth, Cottesloe, Gosnells, Melville and East Fremantle.

(g) Extension of areas served by rubbish removal services.

(h) Establishment of four new land-fill sites : Selection and planning of potential sites for future use.

(i) Extension of use of Bore-hole unit and reduction in pan services.

Comparative Figures of Pan Premises Serviced

1958	9,000
1960	6,800
1962	1,388
1964	987

N.B. Of the total figure, *all* services now remaining are in rural areas with no water service, pensioners, or certain locations, e.g., public baths with a restricted tenure.

2. SUB-DIVISION OF LAND

The years activities were as follows :—

Proposals for Sub-Division

Metropolitan	462
Country	40
State Housing Commission	38
Area Surveys	21
Appeals	22
Taxation Department	14
Industrial Development Department	3
Public Works Department	2
General enquiries, Local Authorities, Land Agents, etc.	217
Total	819

3. ROYAL SHOW

Annual inspection duties at the Royal Show were again the responsibility of the Inspection staff of the Public Health Department.

All aspects of food handling, fly control and Show Ground sanitation received constant attention and were competently handled by five (5) Departmental Officers.

The high standard attained during Royal Show Week can and should be accepted and applied by the many Local Authorities, who have similar responsibilities on a smaller scale, within their districts.

4. FLY CONTROL

Numerous Metropolitan and some Country districts again participated in a Fly Control Campaign in co-operation with the Public Health Department.

Forty University students were employed for periods from four to eight weeks.

Nineteen Local Authorities participated.

A total of 39,059 premises were visited with 3,821 breeding sites being located in these premises.

A detailed report is appended to this report as Appendix A.

5. MOSQUITO CONTROL

Limited activities in this field continued during 1964, following the comprehensive report submitted in 1963.

Special investigations into selected fields of mosquito control were commenced during the year. Details are as follows :—

(a) Preparation of estimates for dredging, filling and draining of potential mosquito breeding sites along the Swan, Canning and Helena Rivers, by the Local Authorities concerned. The compilation of these estimates was far more difficult than anticipated.

(b) Progress of elimination of potential mosquito breeding sites along the Swan and Canning Rivers and fresh water swamps by dredging and filling, and sanitary land-fill.

(c) Maintenance of temporary control of potential mosquito breeding sites along rivers and in swamps, by the use of larvae destroying fish, oils and insecticides.

(d) Repeal of legislation requiring the fitting of induct vents to septic tank and waste water disposal systems.

(e) Experiments carried out :—

- (i) Septic tanks :—
    - (a) Regular use of insecticides.
    - (b) Screening of educt vents.
- (ii) Street storm water gullies using pervious blocks impregnated with insecticides.
- (iii) Bunding of low lying river flats to prevent tidal flooding.
- (iv) Vegetation control in fresh water swamps using weedicides. —
- (v) Fish in impermanent swamp water.

6. PEST CONTROL

Figures relating to the activities of the Pest Control Section, for the year 1964 are submitted hereunder :—

Vermin Destruction

Rats	42
Cats	79
Pigeons	337
Miscellaneous	12
Total	470

Treatments at Government Hospitals and Institutions	125
Treatments at Wooroloo Hospital	13
Treatments at Sewerage Works—Fly Control	48
Treatment for Education Department	60
Miscellaneous	286
Total	532

7. ROUTINE INSPECTIONS

Various aspects of sanitation were involved, including the following :—

(a) *Septic Tanks.*—A total of 9,765 septic tank applications were approved for the year 1964 (some after several amendments).

Combined systems represented 87% of the total number, an increase of 15% over the number of combined systems approved in 1963.

Inspection of six pint flushing systems.—Two hundred and fifty-seven six pint cisterns examined. Two hundred and thirty-five six pint pedestal pans examined.

(b) *Inspection of Imported and Frozen Fish, Fremantle Wharf.*—A total of 1,823.7 tons were examined and passed for human consumption.

(c) *Food and Water Sampling.*—Samples procured during the year totalled 1,370. These comprised :—

Food	57
Miscellaneous	262
Reservoirs	90
Swimming Pools	455
Water sampling at ocean beaches	506
Total	1,370

(d) *General Inspections.*—Towns—81, including hospitals and special inspections.

8. EXPERIMENTAL PROJECTS

Experimental investigations and some special surveys into several selected fields of environmental sanitation were commenced during 1964. They comprised the following items :—

(a) Development of a method for pan sterilising in hospitals.
(b) Sanitation at Football Ovals.
(c) Inspection of Aerodromes.
(d) Various methods and types of liquid wastes disposal systems.
(e) Experimental septic tank systems.

Results, in some cases, are inconclusive at present.

9. MEAT INSPECTION

Details of the Meat Inspection figures for 1964 are shown in an attached Appendix B. The figures cover the four major Metropolitan Abattoirs and numerous Country Abattoirs.

In conclusion, it is desired to express appreciation to all members of the General Inspection Branch for their co-operation and assistance during the year 1964. The results of their efforts augers well for a continuance of greater improvements in the future.

A. A. PILBEAM,
Chief Inspector.

METROPOLITAN FLY CAMPAIGN, 1964/65

Summary of Results

	Number of Students Employed	Time of Employment (in weeks)	Number of Premises Visited	Number of Premises where Breeding Detected	Number of Breeding Places Found	Rubbish Bins	Buried Food Wastes	Poultry Keeping	Incinerators	Mulch	Compost Heaps	Blood and Bone	Animal Manure	Fowl Manure	Lawn Clippings	Others
Shire of Armadale/Kelmscott	1	6	1,116	127	140	6	12	7	2	32	4	....	7	34	31	5
Shire of Bayswater	3	21	2,391	473	499	69	30	105	7	30	16	....	42	54	146	....
Shire of Bassendean	1	11	1,547	168	214	82	28	6	4	11	14	....	17	15	37	....
Shire of Belmont	2	20	3,338	283	283	106	69	33	17	....	3	....	27	6	22	....
Shire of Canning	2	10	2,198	214	214	98	19	....	5	46	10	....	19	9	8	....
Shire of Cockburn	1	6	940	158	158	70	14	23	7	6	4	1	3	2	28	....
Town of Cottesloe	4	16	2,323	156	156	79	4	8	11	10	11	....	4	4	25	....
City of Fremantle	4	51	5,670	424	435	185	39	67	17	38	8	....	15	15	51	....
Shire of Gosnells	2	6	946	70	70	16	4	8	2	1	5	1	16	7	10	....
Town of Midland	1	4	455	42	43	17	1	5	1	....	1	....	4	7	7	....
Shire of Mundaring	1	5	545	44	46	14	3	6	1	1	1	....	9	10	....	1
City of Nedlands	3	12	1,435	196	227	36	22	8	4	18	26	....	18	7	88	....
Shire of Peppermint Grove	1	4	412	43	43	11	....	1	1	7	9	....	3	1	10	....
City of Perth	3	26	3,595	196	196	63	17	12	6	4	25	....	12	8	49	....
Shire of Perth	5	45	4,853	357	357	78	74	25	20	16	14	....	17	17	86	10
Shire of Swan Guildford	2	16	1,140	164	177	44	12	41	3	4	6	....	6	18	43	....
City of South Perth	3	20	3,254	594	697	223	119	75	24	36	26	3	62	....	128	1
City of Subiaco	1	8	1,197	48	48	8	5	10	....	4	3	2	....	6	10	....
Totals	40	287	37,355	3,757	4,003	1,205	472	440	132	264	186	7	281	220	779	17

FLY CAMPAIGN 1964/65

Comparison with 1963/64

Local Authority	Number of Premises Visited		Number of Houses Breeding Flies		Percentage of Houses Breeding Flies	
	1963/64	1964/65	1963/64	1964/65	1963/64	1964/65
Metropolitan—						
Shire of Armadale/Kelmscott	1,031	1,116	170	127	16·5	11·4
Shire of Bayswater	1,869	2,391	476	473	25·5	19·8
Shire of Bassendean	2,327	1,547	253	168	13·3	10·8
Shire of Belmont	2,032	3,338	499	283	24·5	8·5
Shire of Canning	2,321	2,198	446	214	19·2	9·7
Shire of Cockburn	1,136	940	91	158	8·0	16·8
Town of Cottesloe	2,219	2,323	154	156	7·0	6·7
City of Fremantle	5,579	5,670	567	424	10·0	7·4
Shire of Gosnells	1,907	946	185	70	9·7	7·4
Town of Midland	882	455	102	42	11·5	9·2
Shire of Mundaring	791	545	37	44	4·6	8·0
City of Nedlands	2,175	1,435	342	196	15·7	13·7
Shire of Peppermint Grove	424	412	40	43	9·0	10·4
City of Perth	3,564	3,595	161	196	4·5	5·4
Shire of Perth	4,513	4,853	315	357	6·9	7·3
Shire of Swan Guildford	1,063	1,140	111	164	11·0	14·4
City of South Perth	3,633	3,254	309	594	8·5	18·2
City of Subiaco	....	1,197	....	48	....	4·0
Total	51,378	37,355	5,129	3,757	10·0%	10·0%
Country—						
Town of Northam	1,577	1,704	287	64	18·2	3·7

PARTICULARS OF BREEDING SITES

Comparison with 1963/64 and 1964/65

Metropolitan

	1963/64 %	1964/65 %
Rubbish bins	29.1	30.1
Rubbish pits	13.2	11.7
Poultry pens	11.6	10.9
Incinerators	2.9	3.2
Garden beds	7.1	6.7
Lawn clipping heaps	16.1	19.4
Manure heaps	13.3	12.5
Compost heaps	6.5	4.6

FLY CONTROL OFFICERS

Metropolitan and Country

Analysis of Findings During 1964/65 *Campaign*

	Metropolitan	Country
Number of vacancies for Fly Control Officers	40	2
Number of students used to fill vacancies	55	3
Number of Local Authorities employing students	18	1
Number of weeks involved	287	12½
Number of premises inspected	37,355	1,704
Number of premises breeding flies	3,757	64
Number of separate breeding sites found	4,003	68
Premises breeding flies	10%	3.9%

PARTICULARS OF BREEDING SITES

	Metropolitan %	Country %
Rubbish bins	30.1	38.2
Rubbish pits	11.7	1.5
Poultry pens	10.9	41.1
Incinerators	3.2	....
Garden beds	6.7	1.5
Lawn clipping heaps	19.4	4.4
Manure heaps	12.5	13.2
Compost heaps	4.6	....

Fly Campaign 1964/65

LOCAL AUTHORITIES WHICH EMPLOYED TRAINED STUDENTS

Local Authority	Students	Weeks
Metropolitan—		
Shire of Armadale/Kelmscott	1	6
Shire of Bayswater	3	21
Shire of Bassendean	1	11
Shire of Belmont	2	20
Shire of Canning	2	10
Shire of Cockburn	1	6
Town of Cottesloe	4	16
City of Fremantle	4	51
Shire of Gosnells	2	6
Town of Midland	1	4
Shire of Mundaring	1	5
City of Nedlands	3	12
Shire of Peppermint Grove	1	4
City of Perth	3	26
Shire of Perth	5	45
Shire of Swan Guildford	2	16
City of South Perth	3	20
City of Subiaco	1	8
Total	40	287
Country—		
Town of Northam	2	12.4

Appendix XV

Commissioner of Public Health

The following is a report on the activities of the Public Buildings Section for 1964.

PUBLIC BUILDINGS

There has been an increase in the volume of work during this year and it was fortunate that the services of an additional inspector had been obtained. Three hundred and sixty-five plans were approved which includes new buildings, alterations and additions to existing buildings and electrical re-wire of buildings.

In one city theatre sever damage occurred in the upstairs foyer area when a fire broke-out. The theatre was empty at the time of the fire.

Another case was a country hall which had its bio-box destroyed by fire. In this instance also, the building was empty when the fire occurred.

No reports of personal injury in public buildings were received by this section during the year.

The work of supervising the construction of " C " class hospitals has been allocated to this section.

The Health Act (Swimming Pool) Regulations were gazetted on 15th October, 1964. The administration of the swimming pools regulations was assigned to this section, this involves plan examination, periodical inspections during construction and the testing of the water for the determination of chlorine content.

At the request of the R.A.A.F. Station Pearce, a lecture on swimming pool management (as allied to the Swimming Pool Regulations) was given to the Station Swimming Pool personnel on 11th November, 1964.

Many new lining materials for use in public buildings were submitted for approval during the year, most of these were forwarded to the Government Chemical Laboratories for testing to evaluate the coefficient of fire resistivity.

This department is indebted to several officers of the Architectural Division, Public Works Department for the assistance and advice given, especially those of the Structural Engineer's Office, the Electrical Services and the Mechanical Services.

R. T. DUNSTAN,
Senior Inspector, Public Buildings Section.

Appendix XVI

Royal Perth, Fremantle, Princess Margaret, Sir Charles Gairdner, and King Edward Memorial Hospitals

ALL PATIENTS DISCHARGED, 1964, IN AGE GROUPS

Age Group	Number of Cases		Per cent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. Days in Hospital	
	Male	Female		Male	Female		Male	Female
0–14	5,555	3,875	24·73	35,031	24,367	11·93	6·31	6·29
15–19	1,083	1,707	7·32	12,551	15,814	5·70	11·59	9·26
20–29	1,636	3,870	14·44	19,317	36,328	11·17	11·81	9·39
30–39	1,412	2,422	10·05	19,336	26,335	9·17	13·69	10·87
40–49	1,558	1,806	8·82	23,853	25,928	9·99	15·31	14·36
50–59	2,032	1,779	10·00	35,812	30,252	13·27	17·62	17·00
60–69	2,137	2,027	10·92	44,657	39,437	16·89	20·90	19·46
70 and over	2,279	2,955	13·72	45,089	63,893	21·88	19·78	21·62
Total	17,692	20,441	100·00	235,646	262,354	100·00	13·32	12·83
Total Male and Female	38,133			498,000			13·06	

Daily Bed Average : 1,360·7

OPERATION CASES IN AGE GROUPS, 1964

Age Group	Number of Cases		Per cent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hospital	
	Male	Female		Male	Female		Male	Female
0–14	2,297	1,636	10·31	15,415	9,992	5·10	6·71	6·11
15–19	667	616	3·36	8,262	6,331	2·93	12·39	10·28
20–29	966	1,149	5·55	12,772	9,493	4·47	13·22	8·26
30–39	739	1,075	4·76	11,094	10,716	4·38	15·01	9·97
40–49	811	993	4·74	12,065	13,671	5·18	14·88	13·79
50–59	962	894	4·87	17,227	14,559	6·38	17·91	16·29
60–69	926	925	4·85	20,143	18,847	7·83	21·75	20·38
70 and over	932	1,135	5·41	21,998	29,504	10·33	23·60	25·99
Total	8,300	8,423	43·85	118,976	113,113	46·60	14·33	13·43
Total Male and Female	16,723			232,089			13·88	

Daily Bed Average : 634·1

Royal Perth, Fremantle, Princess Margaret, Sir Charles Gairdner and King Edward Memorial Hospitals

PATIENTS DISCHARGED DURING 1964

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Average Age of Patients		Results*					
			Male	Female	Male	Female		Male	Female	Male	Female	Sex	1	2	3	4	5
1	Tuberculosis, All Forms	001–019	110	75	10,377	6,988	3·49	94·3	93·2	52	45	M.	1	79	25	....	5
												F.	2	56	16	....	1
2	Syphilis, Gonorrhoea and other Venereal Diseases	020–039	10	10	147	110	·05	14·7	11·0	60	28	M.	....	8	2	....	....
												F.	2	6	2	....	....
3	Other Infectious Diseases	040–138	431	354	4,496	3,794	1·67	10·4	10·7	19	19	M.	54	345	19	3	10
												F.	49	288	11	1	5
4	Malignant Neoplasms, including those of Lymphatic and Haematopoitic Systems	140–205	977	950	19,513	19,784	7·89	20·0	20·8	61	60	M.	28	415	299	22	213
												F.	45	453	261	29	162
5	Benign and Unspecified Neoplasms	210–239	205	422	2,352	3,995	1·28	11·5	9·5	33	42	M.	29	143	23	8	2
												F.	96	270	20	32	4
6	Allergic Disorders	240–245	230	348	1,698	3,033	·95	7·4	8·7	25	31	M.	6	212	9	1	2
												F.	13	316	14	....	5
7	Diseases of Thyroid Gland	250–254	15	76	275	1,073	·27	18·3	14·1	44	49	M.	3	6	6	....	....
												F.	17	46	10	1	2
8	Diabetes Mellitus	260	77	124	1,992	3,311	1·07	25·9	26·7	49	60	M.	2	57	13	....	5
												F.	1	90	15	1	17
9	Diseases of Other Endocrine Glands	270–277	28	26	493	296	·16	17·6	11·4	42	36	M.	2	14	11	....	1
												F.	....	9	16	....	1
10	Avitaminoses and Other Metabolic Diseases	280–289	55	35	1,242	525	·35	22·6	15·0	51	48	M.	1	40	11	1	2
												F.	1	21	9	1	3
11	Diseases of Blood-Forming Organs and Blood	290–299	179	166	1,818	2,559	·88	10·2	15·4	36	54	M.	2	111	59	....	7
												F.	7	120	30	2	7
12	Mental Psychoneurotic and Personality Disorders	300–326	538	735	7,319	11,993	3·88	13·6	16·3	43	42	M.	15	307	205	2	9
												F.	17	499	203	5	11
13	Vascular Lesions affecting Central Nervous System	330–334	242	270	7,878	9,169	3·42	32·6	34·0	66	69	M.	2	138	34	1	67
												F.	3	131	39	....	97
14	Inflammatory and Other Diseases of Central Nervous System	340–357	292	260	4,433	4,471	1·79	15·2	17·2	32	42	M.	15	174	85	5	13
												F.	14	168	64	3	11
15	Diseases of Nerves and Peripheral Ganglia	360–369	76	77	1,358	904	·45	17·9	11·7	52	50	M.	6	54	14	2	....
												F.	4	58	14	....	1
16	Diseases of the Eye	370–389	455	433	5,097	4,736	1·97	11·2	10·9	41	46	M.	13	373	64	2	3
												F.	9	354	63	7	....
17	Diseases of Ear and Mastoid Process	390–398	270	261	1,752	1,930	·74	6·5	7·4	18	27	M.	3	243	21	2	1
												F.	3	230	26	2	....
18	Rheumatic Fever and Chronic Rheumatic Heart Disease	400–416	99	103	2,254	2,102	·87	22·8	20·4	30	35	M.	8	65	21	1	4
												F.	4	67	28	....	4
19	Diseases of the Heart and Arteries including Hypertension and Arteriosclerosis	420–456	942	756	19,731	15,341	7·04	20·9	20·3	62	67	M.	15	641	122	7	157
												F.	19	497	65	4	171
20	Diseases of Veins and Other Diseases of Circulatory System	460–468	270	344	3,933	4,626	1·72	14·6	13·4	46	48	M.	45	194	17	3	11
												F.	61	246	26	1	10

21	Diseases of Respiratory System	470–527	2,214	1,696	19,667	12,440	6·45	8·9	7·3	28	25	M.	405	1,621	106	4	78
												F.	415	1,177	55	4	45
22	Diseases of Buccal Cavity and Oesophagus	530–539	142	200	441	817	·25	3·1	4·1	21	28	M.	73	61	7	....	1
												F.	102	85	12	1	....
23	Diseases of Stomach and Duodenum	540–545	315	164	4,996	2,700	1·55	15·9	16·5	51	55	M.	39	225	20	10	21
												F.	24	121	11	3	5
24	Appendicitis	550–553	451	418	3,652	3,286	1·39	8·1	7·9	25	22	M.	347	101	1	....	2
												F.	323	94	1	....	....
25	Hernia of Abdominal Cavity	560–561	366	188	3,927	2,901	1·37	10·7	15·4	45	55	M.	117	223	21	....	5
												F.	65	100	15	3	5
26	Other Diseases of Intestines and Peritoneum	570–578	503	546	5,487	6,618	2·43	10·9	12·1	27	36	M.	49	405	22	14	13
												F.	85	403	35	7	16
27	Diseases of Liver and Gall Bladder	580–586	135	312	2,757	5,543	1·67	20·4	17·8	60	57	M.	23	76	16	2	18
												F.	65	195	35	5	12
28	Diseases of Pancreas	587	50	31	580	671	·25	11·6	21·6	38	51	M.	4	32	8	1	5
												F.	....	27	3	....	1
29	Nephritis and Nephrosis	590–594	77	90	1,292	1,392	·54	16·8	15·5	22	33	M.	....	58	7	....	12
												F.	1	63	12	....	14
30	Other Diseases of Urinary System	600–609	278	418	3,179	4,976	1·64	11·4	11·9	46	42	M.	33	164	30	45	6
												F.	39	274	46	48	11
31	Diseases of Male Genital Organs	610–617	382	....	5,505	....	1·11	14·4	....	48	....	M.	89	241	19	24	9
												F.	....	....	....	....	....
32	Diseases of Breast	620–621	3	50	19	245	·05	6·3	4·9	55	41	M.	....	2	1	....	....
												F.	10	30	2	8	....
33	Diseases of Female Genital Organs, Uterus, Ovary, Fallopian Tubes, Parametrium	622–637	....	1,086	....	8,620	1·73	....	7·9	....	41	M.	....	....	....	....	....
												F.	128	613	101	244	....
34	Complications of Pregnancy	640–649	....	582	....	3,028	·61	....	5·2	....	25	M.	....	....	....	....	....
												F.	24	547	5	5	1
35	Abortion	650–652	....	553	....	1,849	·37	....	3·3	....	28	M.	....	....	....	....	....
												F.	276	273	3	1	....
36	Delivery Without Mention of Complication	660	....	3,003	....	34,964	7·02	....	11·6	....	26	M.	....	....	....	....	....
												F.	....	3,003	....	....	....
37	Delivery with Specified Complication	670–678	....	46	....	238	·05	....	5·2	....	27	M.	....	....	....	....	....
												F.	6	40	....	....	....
38	Complications of the Puerperium	680–689	....	17	....	173	·03	....	10·2	....	26	M.	....	....	....	....	....
												F.	1	13	2	....	1
39	Diseases of Skin and Cellular Tissue	690–716	526	462	7,585	6,465	2·82	14·4	14·0	32	40	M.	70	428	21	4	3
												F.	70	369	18	2	3
40	Arithritis and Rheumatism, except Rheumatic Fever	720–727	167	250	4,154	7,575	2·36	24·9	30·3	46	59	M.	2	139	24	....	2
												F.	5	186	56	1	2
41	Osteomyelitis and Other Bone and Joint Diseases	730–738	333	187	5,158	3,530	1·74	15·5	18·9	32	44	M.	6	296	27	4	....
												F.	6	156	19	3	3
42	Other Diseases of Musculoskeletal System	740–749	194	207	2,458	2,370	·97	12·7	11·4	32	46	M.	14	154	24	2	....
												F.	26	168	12	....	1
43	Congenital Malformations	750–759	334	301	4,055	3,547	1·53	12·1	11·8	10	11	M.	19	238	64	1	12
												F.	12	219	58	3	9
44	Birth Injuries, Asphyxia and Infections of Newborn	760–776	67	52	695	539	·25	10·4	10·4	9	8	M.	7	47	8	2	3
												F.	2	43	3	1	3
45	Symptons Referable to Systems or Organs	780–789	1,148	1,046	9,822	9,370	3·85	8·6	9·0	36	37	M.	70	821	148	80	29
												F.	70	728	138	88	22
46	Senility and Ill Defined Diseases	790–795	129	200	1,813	2,435	·85	14·1	12·2	43	46	M.	6	72	38	3	10
												F.	4	131	48	11	6
	Total	....	13,315	17,930	185,400	227,032	82·82	13·9	12·7	38	38	....	3,749	22,006	3,294	783	1,413

PATIENTS DISCHARGED DURING 1964—*continued*

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Average Age of Patients		* Results					
			Male	Female	Male	Female		Male	Female	Male	Female	Sex	1	2	3	4	5
47	Fractures of Skull and Face Bones	N800–N804	300	91	3,375	1,272	·93	11·3	14·0	29	25	M.	26	236	23	....	15
												F.	9	73	5	....	4
48	Fractures and Dislocations of Vertebral Column	N805–N806	92	31	3,618	921	·91	39·3	29·7	34	48	M.	2	56	30	....	4
												F.	1	22	8	....	....
49	Other Fractures of Trunk, Sternum, Larynx and Pelvis	N807–N809	106	52	1,882	995	·58	17·8	19·1	43	53	M.	10	88	1	....	7
												F.	4	47	1	....	....
50	Fractures of Upper Limb	N810–N819	415	224	2,591	1,181	·77	6·2	5·3	22	29	M.	9	395	10	....	1
												F.	4	213	6	....	1
51	Fractures of Lower Limb	N820–N829	478	425	13,431	16,457	6·00	28·1	38·7	37	60	M.	7	440	20	....	11
												F.	17	357	14	....	37
52	Dislocation without Fracture	N830–839N	96	41	1,210	392	·32	12·6	9·6	31	40	M.	13	80	3	....	....
												F.	2	35	4	....	....
53	Sprains and Strains	N840–N848	136	60	1,243	537	·36	9·1	9·0	34	37	M.	7	124	4	1	....
												F.	3	50	6	1	....
54	Head Injury (excluding Skull Fracture)	N850–N856	1,052	425	7,698	2,780	2·10	7·3	6·5	27	29	M.	206	785	30	8	23
												F.	77	329	9	6	4
55	Internal Injury of Chest, Abdomen and Pelvis	N860–N869	82	32	1,484	395	·38	18·1	12·3	32	28	M.	19	55	3	2	3
												F.	6	23	....	....	3
56	Lacerations, Contusions and Superficial Injuries	N870–N929	780	303	5,242	2,348	1·52	6·7	7·7	26	26	M.	57	697	23	3	....
												F.	24	272	6	1	....
57	Effects of Foreign Body entering through Orifice	N930–N936	74	94	361	376	·15	4·9	4·0	28	34	M.	11	55	6	1	1
												F.	8	82	3	1	....
58	Burns	N940–N949	220	122	4,598	2,471	1·42	20·9	20·3	18	18	M.	27	180	8	....	5
												F.	17	96	1	....	8
59	Injury to Nerves and Spinal Cord without Bone Injury	N950–N959	31	12	198	142	·07	6·4	11·8	31	39	M.	1	25	5	....	....
												F.	....	7	5	....	....
60	Effects of Poisons	N960–N979	272	368	1,464	2,440	·78	5·4	6·6	22	31	M.	43	217	9	2	1
												F.	74	263	27	....	4
61	Effects of Exposure and Unspecified Injuries and Reactions	N980–N999	88	79	805	537	·27	9·1	6·8	24	32	M.	13	72	2	....	1
												F.	8	66	2	1	2
	Total (N Categories)	....	4,222	2,359	49,200	33,244	16·56	11·7	14·1	28	35	....	705	5,440	274	27	135
62	Investigations, Observations and After Care	Y00–Y10	155	152	1,046	2,078	·62	6·7	13·7	33	35	M.	21	100	17	16	1
												F.	11	99	26	16	....
	Total (Y Categories)	....	155	152	1,046	2,078	·62	6·7	13·7	33	35	....	32	199	43	32	1
	Grand Total	....	17,692	20,441	235,646	262,354	100·00	13·32	12·83	36	37	....	4,486	27,645	3,611	842	1,549

* Results : 1 = Cured
2 = Improved
3 = Unchanged
4 = Investigation only
5 = Death

Royal Perth, Fremantle, Princess Margaret, Sir Charles Gairdner and King Edward Memorial Hospitals

OPERATION CASES DISCHARGED, 1964

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds *	Average Number Days in Hospital		Average Age of Patients		Results					
			Male	Female	Malo	Female		Male	Female	Male	Female	Sex	1	2	3	4	5
1	Neurosurgery, Brain and Cerebral Meninges	001–019	241	135	6,472	3,867	4·45	26·9	28·6	38	40	M.	13	129	65	2	32
												F.	5	73	38	1	18
2	Neurosurgery, Spinal Cord and Spinal Meninges	020–029	75	49	2,245	1,910	1·79	29·9	39·0	43	41	M.	8	40	23	....	4
												F.	5	23	12	1	8
3	Neurosurgery, Peripheral Nerves and Sympathetic System	030–049	70	40	1,285	929	·95	18·4	23·2	43	45	M.	6	52	11	1	....
												F.	3	29	8	....	....
4	Thyroid and Parathyroid	070–079	17	46	186	530	·31	10·9	11·5	37	48	M.	6	11	....	....	....
												F.	17	27	1	1	....
5	Adrenals	080–084	2	4	65	168	·10	32·5	42·0	26	60	M.	....	2	....	....	....
												F.	....	4	....	....	....
6	Pituitary, Thymus and Other Endocrine Organs	085–096	2	1	38	18	·02	19·0	18·0	48	19	M.	....	2	....	....	....
												F.	....	1	....	....	....
7	Opthalmic Operations	100–199	421	403	5,534	5,096	4·58	13·1	12·6	38	40	M.	12	378	26	2	3
												F.	10	366	23	3	1
8	Ear, Nose and Throat	200–249	555	401	5,875	2,753	3·72	10·6	6·9	27	30	M.	23	475	33	9	15
												F.	12	354	25	2	8
9	Teeth and Gums	250–259	107	140	368	356	·31	3·4	2·5	18	22	M.	72	28	7	....	....
												F.	99	36	5	....	....
10	Pharynx, Tongue, Palate and Buccal Cavity	260–299	560	652	2,113	2,615	2·04	3·8	4·0	16	19	M.	285	248	20	3	4
												F.	323	300	24	4	1
11	Heart and Pericardium and Intrathoracic Great Vessels	300–329	79	65	1,353	986	1·01	17·1	15·2	32	22	M.	13	37	20	....	9
												F.	10	40	12	....	3
12	Lung, Bronchus and Mediastinum and Collapse Therapy	330–354	171	86	3,767	2,482	2·69	22·0	28·9	49	42	M.	20	92	44	3	12
												F.	10	56	11	2	7
13	Operation on Breast	380–389	8	143	75	2,259	1·01	9·4	15·8	55	55	M.	....	6	2	....	....
												F.	31	87	5	19	1
14	Operation on Abdominal Wall	400–419	473	277	7,008	5,133	5·23	14·8	18·5	46	52	M.	131	273	24	14	31
												F.	82	128	22	26	19
15	Operation on Stomach	420–439	181	83	3,596	2,040	2·43	19·9	24·6	48	55	M.	33	115	13	7	13
												F.	15	54	11	3	....
16	Operation on Appendix	440–449	458	441	3,750	3,464	3·11	8·2	7·9	24	22	M.	345	111	1	....	1
												F.	332	107	1	....	1
17	Operation on Intestines (except Appendix and Rectum)	450–469	152	121	3,285	2,827	2·63	21·6	23·4	51	54	M.	19	100	13	7	13
												F.	13	75	17	9	7
18	Operation on Rectum and Anus	470–499	165	121	2,118	1,958	1·76	12·8	16·2	47	51	M.	49	110	4	1	1
												F.	42	76	2	....	1
19	Operation on Liver and Bile Ducts	500–529	93	213	2,244	3,989	2·69	24·1	18·7	58	55	M.	25	55	4	4	5
												F.	66	130	11	4	2
20	Operation on Pancreas	530–539	2	5	51	106	·07	25·5	21·2	46	38	M.	2	....	....	....	....
												F.	2	2	1	....	....
21	Operation on Spleen	540–549	28	14	814	290	·48	29·1	20·7	24	30	M.	8	19	....	....	1
												F.	2	11	....	....	1

Royal Perth, Fremantle, Princess Margaret, Sir Charles Gairdner and King Edward Memorial Hospitals

OPERATION CASES DISCHARGED, 1964—*continued*

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds *	Average Number Days in Hospital		Average Age of Patients		Results					
			Male	Female	Male	Female		Male	Female	Male	Female	Sex	1	2	3	4	5
22	Operation on Kidney and Ureter	600–639	139	109	2,596	2,104	2·03	18·7	19·3	42	45	M.	21	92	14	9	3
												F.	13	67	16	11	2
23	Operation on Bladder and Urethra	640–669	364	225	5,064	2,701	3·35	13·9	12·0	53	50	M.	17	175	56	99	17
												F.	21	99	30	74	1
24	Operation on Prostate and Seminal Vesicles	670–679	223	....	5,989	....	2·58	26·9	....	71	....	M.	63	133	6	5	16
												F.	....	....	....	....	....
25	Other Male Genital Organs	680–699	199	....	1,634	....	·70	8·2	....	20	....	M.	35	155	5	2	2
												F.	....	....	....	....	....
26	On Ovary and Fallopian Tubes	700–719	....	189	....	2,330	1·00	....	12·3	....	....	M.	....	....	....	....	....
												F.	20	144	9	15	1
27	On Uterus and Supporting Structures	720–739	....	887	....	7,246	3·12	....	8·2	....	43	M.	....	....	....	....	....
												F.	83	507	79	217	1
28	On Vagina, Vulva and Perineum	740–759	....	288	....	4,139	1·78	....	14·4	....	53	M.	....	....	....	....	....
												F.	64	181	37	5	1
29	Obstetric Operations (D. and C.)....	760–799	....	777	....	5,009	2·16	....	6·4	....	28	M.	....	....	....	....	....
												F.	286	467	....	24	....
30	Orthopaedic Surgery	800–899	1,727	1,156	28,547	27,072	23·96	16·5	23·4	32	46	M.	91	1,555	55	9	17
												F.	75	989	50	3	39
31	On Peripheral Blood Vessels and Lymphatic System	900–929	133	184	2,095	2,306	1·90	15·8	12·5	46	46	M.	7	86	24	7	9
												F.	27	124	24	4	5
32	On Skin and Subcutaneous Tissues	930–949	1,220	761	14,407	8,873	10·03	11·8	11·7	32	35	M.	195	989	27	4	5
												F.	162	573	18	....	8
33	Other Surgical Procedures	950–999	435	407	6,402	7,557	6·01	14·7	18·6	41	45	M.	22	329	53	1	30
												F.	26	289	53	4	35
	Total	....	8,300	8,423	118,976	113,113	100·00	14·3	13·4	36	39	....	3,377	11,216	1,095	621	414

* Operation cases occupied 46·60% of the total bed days. To find the percentage of total beds occupied by the various type of operation cases, multiply the percentage figure in Column 6 by 0·466.

Royal Perth, Fremantle, Princess Margaret, Sir Charles Gairdner and King Edward Memorial Hospitals

ACCIDENTS, POISONINGS AND VIOLENCE, 1964

Accident	"E" Code	Number of Patients	Days in Hospital	Percentage of Hospital Beds Occupied	Average Age of Patients	Number Died
Railway Accidents	800–802	21	433	·09	38	....
Motor Vehicle Traffic Accidents	810–825	1,827	27,572	5·54	29	42
Motor Vehicle Non-Traffic Accidents	830–835	51	1,065	·21	30	2
Other Road Vehicle Accidents	840–845	115	1,230	·25	19	1
Water Transport Accidents	850–858	13	78	·02	37	....
Aircraft Accidents	860–866	2	31	·006	25	....
Accidental Poisoning	870–895	236	631	·13	10	1
Accidental Falls	900–904	1,521	24,376	4·89	40	61
Accidents caused by Hot Substances, Corrosive or Steam	917	189	2,653	·53	11	1
Other Accidents	910–936	1,771	15,787	3·17	26	16
Medical and Surgical Complications and Therapeutic Misadventures	940–959	171	1,626	·33	36	1
Late Effects of Injury	960–965	96	2,263	·45	36	....
Suicide and Self-Inflicted Injury	970–979	419	3,744	·75	37	8
Homicide and Assault	980–985	139	830	·17	36	2
Total	....	6,571	82,319	16·53	30	135

ALL PATIENTS DISCHARGED

Hospital	1964				1963			
	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average
Fremantle Hospital	8,501	78,227	9·2	213·7	8,021	75,972	9·5	208·1
Princess Margaret Hospital	6,918	45,616	6·6	124·6	7,382	49,381	6·7	135·3
Royal Perth Hospital	15,478	266,503	17·2	728·2	13,283	225,673	17·0	618·3

OPERATION CASES

Hospital	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average
Fremantle Hospital	5,187	45,214	8·7	123·5	4,777	41,450	8·7	113·6
Princess Margaret Hospital	2,393	17,614	7·4	48·1	2,490	19,112	7·7	52·4
Royal Perth Hospital	7,448	144,850	19·4	395·8	5,792	117,072	20·2	320·7

ACCIDENTS, POISONINGS AND VIOLENCE

Hospital	Number of Cases	Days Stay in Hospital	Per cent. of Total Hospital Beds Occupied	Number Died	Number of Cases	Days Stay in Hospital	Per cent. of Total Hospital Beds Occupied	Number Died
Fremantle Hospital	1,611	14,876	19·02	18	1,556	15,166	19·96	24
Princess Margaret Hospital	1,369	8,159	17·88	9	1,346	7,979	18·88	11
Royal Perth Hospital	3,481	58,112	21·81	105	2,837	50,227	22·26	81

Appendix XVII

DERBY LEPROSARIUM

WESTERN AUSTRALIA

Admissions and Discharges for the Year 1964, compiled from the Monthly Returns of the Superintendent

Month	Admissions							Discharged											Inmates Remaining in Leprosarium		
	Males			Females			Total Admitted	Males					Females					Total Discharged	Males	Females	Total Remaining
	Admitted	Re-Admitted	Total Males	Admitted	Re-Admitted	Total Females		Discharged Cured	Deceased	Absconded	Discharged Non-Infectious	Total Males Discharged	Discharged Cured	Deceased	Absconded	Discharged Non-Infectious	Total Females Discharged				
January	....	1	1	....	....	....	1	2	....	....	....	2	....	....	....	....	....	2	95	70	165
February	....	....	....	1	....	1	1	....	....	....	....	....	1	....	....	....	1	1	95	70	165
March	....	1	1	1	1	2	3	....	1	....	....	1	....	....	....	....	....	1	95	72	167
April	....	2	2	....	1	1	3	....	....	....	....	....	....	....	....	....	....	....	97	73	170
May	....	1	1	....	....	....	1	1	....	....	....	1	....	....	....	....	....	1	97	73	170
June	2	....	2	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	99	73	172
July	1	....	1	....	1	1	2	4	....	....	....	4	3	....	....	....	3	7	96	71	167
August	....	....	....	....	....	....	....	2	1	....	....	3	....	1	....	....	1	4	93	70	163
September	1	....	1	1	....	1	2	....	1	....	....	1	....	....	....	....	....	1	93	71	164
October	....	....	....	3	....	3	3	3	1	....	....	4	2	2	....	....	4	8	89	70	159
November	....	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	90	70	160
December	2	2	4	....	1	1	5	1	....	....	....	....	....	....	....	....	....	1	93	71	164
Total	6	8	14	6	4	10	24	13	4	....	....	17	6	3	....	....	9	26	....	....	....

Analysis of Admissions and Discharges During 1964

Inmates as at 31st December, 1963	166
Admissions for period ended 31st December, 1964	24
Discharged for period ended 31st December, 1964	19
Deaths for period ended 31st December, 1964	7
Absconded for period ended 31st December, 1964	—
Total Remaining at Leprosarium, 31st December, 1964	164

Appendix XVIII

INCIDENCE AND MORTALITY OF NOTIFIABLE DISEASES

Diseases Notifiable	1961			1962			1963			1964		
	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths
Acute Rheumatism	10	10	(A) 3	9	9	(A) 4	18	18	....	8	8	....
Amoebiasis	2	2	....	1	1	....	1	1	....	1	1	....
Ankylostomiasis	....	....	2	15	15	....	....	....	....	37	37	....
Breast Abscess	....	....	....	9	9	....	4	4	....	4	4	....
Brucellosis	5	5	....	6	6	....	7	7	....	4	4	1
Chorea	....	....	....	....	....	....	1	1	....	....	....	....
Dengue Fever	....	....	....	....	....	....	....	....	....	....	....	....
Diphtheria	15	15	....	17	17	1	5	5	....	3	3	....
Dysentery (Amoebic)	5	5	....	2	2	....	2	2	1	2	2	....
Dysentery (Bacillary)	117	117	3	179	179	5	102	102	1	135	135	6
Encephalitis Lethargic	2	2	....	....	....	....	....	....	2	....	....	....
Erythema Nodosum	....	....	....	....	....	....	1	1	....	....	....	....
Hydatid	....	....	....	1	1	1	....	....	....	3	3	1
Infantile Diarrhoea	48	48	(B) 23	49	49	(B) 24	2	2	(B) 20	44	44	23
Infective Hepatitis	262	262	4	115	115	2	144	144	7	100	100	3
Lead Poisoning	1	1	....	1	1	....	1	1	....	....	....	....
Leprosy	15	15	....	17	17	....	10	10	....	11	11	....
Leptospirosis	13	13	....	7	7	....	16	16	....	4	4	....
Malaria	2	2	....	3	3	....	31	31	....	5	5	....
Meningococcal Infection	2	2	1	2	2	4	4	4	1	1	1	1
Ornithesis	2	2	....	....	....	....	....	....	....	....	....	....
Paratyphoid	6	6	....	1	1	....	3	3	....	....	....	....
Poliomyelitis	3	3	....	6	6	1	5	5	2	....	....	....
Pleural Effusion	19	12	....	10	5	....	4	2	....	4	1	....
Puerperal Fever	3	3	....	....	....	....	4	4	....	3	3	....
Purulent Opthalmia	29	29	....	29	29	....	36	36	....	14	14	....
Rubella	264	264	2	106	106	....	107	107	....	190	190	....
Salmonella Infection	43	43	....	61	61	1	36	36	1	61	61	1
Scarlet Fever	45	45	....	30	30	....	35	35	....	61	61	....
Tetanus	5	5	2	1	1	2	9	9	2	8	8	5
Trachoma	369	369	....	377	377	....	259	259	....	147	147	....
P.T.B.	246	197	18	275	238	24	252	216	13	225	176	20
Other T.B.	43	41	1	29	25	5	30	28	....	33	31	....
Typhoid Fever	4	4	....	5	5	....	6	6	....	....	....	....
Typhus Fever	4	4	....	....	....	....	2	2	....	....	....	....

Deaths exclude full-blood aboriginals.

(A) Rheumatic Fever.

(B) Gastro-Enteritis and Colitis (except Ulceration) under two years and Diarrhoea of the new born

Appendix XIX

MATERNAL MORTALITY

Period	Average Live Births	Average Maternal Deaths	Average Rate
1901–1905	6,681	28·0	4·19
1906–1910	7,691	43·4	5·64
1911–1915	8,844	39·4	4·46
1916–1920	7,726	41·4	5·36
1921–1925	8,056	34·2	4·25
1926–1930	8,748	46·8	5·35
1931–1935	8,062	35·4	4·39
1936–1940	8,877	32·4	3·65
1941–1945	10,408	24·4	2·34
1946–1950	13,130	21·4	1·63
1951–1955	15,724	13·8	0·88
1956–1960	16,922	8·2	0·48

Year	Live Births	Deaths From									
		Puerperal Septicaemia		Other Puerperal Infection		Abortion		All other Complications of Pregnancy and of the Puerperal State		All Complications of Pregnancy and the Puerperal State	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1946	12,105	....	....	3	0·25	5	0·41	18	1·49	26	2·15
1947	12,874	1	0·08	1	0·08	8	0·62	22	1·71	32	2·49
1948	12,981	2	0·15	4	0·31	1	0·08	13	1·00	20	1·55
1949	13,511	....	....	2	0·15	3	0·22	11	0·81	16	1·18
1950	14,228	....	....	2	0·14	1	0·07	10	0·70	13	0·91
1951	14,794	....	....	2	0·14	3	0·02	11	0·74	16	1·08
1952	15,413	....	....	3	0·19	3	0·19	12	0·78	18	1·17
1953	15,862	....	....	....	....	1	0·06	8	0·50	9	0·57
1954	15,928	....	....	....	....	5	0·31	7	0·44	12	0·75
1955	16,623	....	....	....	....	1	0·06	13	0·78	14	0·84
1956	16,916	....	....	....	....	2	0·12	7	0·41	9	0·53
1957	16,924	....	....	....	....	3	0·18	8	0·47	11	0·65
1958	16,731	....	....	....	....	1	0·06	7	0·42	8	0·48
1959	17,111	....	....	....	....	1	0·06	4	0·23	5	0·29
1960	16,926	1	0·06	....	....	3	0·18	4	0·24	8	0·47
1961	17,078	....	....	....	....	2	0·12	5	0·29	7	0·41
1962	17,064	....	....	....	....	1	0·06	4	0·23	5	0·29
1963	17,290	....	....	....	....	1	0·06	3	0·17	4	0·23
1964	16,685	....	....	....	....	3	0·18	3	0·18	6	0·36

All Rates per thousand live births

Place	1960	1961	1962	1963	1964
Western Australia	0·47	0·41	0·29	0·23	0·36
New Zealand (a)	0·34	0·33	(b)	(b)	....
New South Wales	0·68	0·50	0·34	0·32	....
Victoria	0·25	0·32	0·18	0·21	....
Queensland	0·68	0·76	0·64	0·25	....
Tasmania	0·45	0·33	0·33	0·23	....
South Australia	0·62	0·27	0·61	0·28	....

(*a*) Non-Maori. (*b*) Not available.

Appendix XX

STILLBIRTH AND INFANT MORTALITY RATES

Year	Total Births including Stillbirths	Stillbirth Rates	Mortality Rates			Total mortality rates under one year	Total mortality rates under one year including Stillbirth
			Under one week	Under one month	Over one month and under one year		
1946	12,398	23·1	17·1	20·6	9·6	30·3	53·4
1947	13,178	23·2	16·9	19·4	1·2	30·2	53·4
1948	13,197	20·5	16·9	18·7	8·4	25·0	45·5
1949	13,779	19·4	16·2	19·0	6·8	25·9	45·3
1950	14,468	16·6	16·2	18·0	8·6	26·7	43·3
1951	15,091	19·7	16·2	19·7	8·5	28·2	47·9
1952	15,697	18·1	15·5	17·7	6·8	24·5	42·6
1953	16,130	16·6	13·4	16·2	7·3	23·4	40·0
1954	16,198	16·7	14·2	15·8	6·4	22·2	38·9
1955	16,862	14·2	13·3	15·8	6·3	22·1	36·3
1956	17,142	13·2	13·0	15·7	6·7	22·4	35·6
1957	17,169	14·3	13·6	14·9	5·9	20·8	35·1
1958	16,956	13·3	12·8	14·2	7·1	21·2	34·5
1959	17,336	13·0	12·3	13·6	6·3	19·9	32·9
1960	17,152	13·2	13·9	15·7	5·7	21·3	34·5
1961	17,318	13·9	10·3	12·6	6·8	19·4	33·3
1962	17,267	11·8	12·6	14·3	7·7	22·0	33·8
1963	17,468	10·2	12·3	14·7	5·5	20·2	30·4
1964	16,855	10·1	11·8	12·9	6·6	19·5	29·5

In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

INFANT MORTALITY

Year	Births	Infant Mortality per 1,000 Live Births
1946	12,105	31·06
1947	12,874	30·92
1948	12,931	25·60
1949	13,511	26·42
1950	14,228	27·13
1951	14,794	28·73
1952	15,413	24·91
1953	15,862	23·83
1954	15,928	22·54
1955	16,623	22·44
1956	16,916	22·70
1957	16,924	21·09
1958	16,731	21·52
1959	17,111	20·16
1960	16,926	21·62
1961	17,078	19·67
1962	17,064	22·27
1963	17,290	20·42
1964	16,685	19·66

Appendix XXI

WESTERN AUSTRALIA – STILLBIRTH AND BIRTH RATES

Year	Mean Population	Live Births		Stillbirths	
		Number	Rate per 1,000 Mean Population	Number	Rate per 1,000 Total Births
1950	557,878	14,228	25·50	240	16·59
1951	580,317	14,794	25·49	297	19·68
1952	600,615	15,413	25·66	284	18·09
1953	621,034	15,862	25·54	268	16·62
1954	639,963	15,928	24·89	270	16·67
1955	657,323	16,623	25·29	239	14·17
1956	674,459	16,916	25·08	226	13·18
1957	687,448	16,924	24·62	245	14·27
1958	699,915	16,731	23·90	225	13·27
1959	711,737	17,111	24·04	225	12·98
1960	722,900	16,926	23·41	226	13·18
1961	737,386	17,078	23·16	240	13·86
1962	755,259	17,064	22·59	203	11·76
1963	773,235	17,290	22·36	178	10·19
1964	790,224	16,685	21.11	170	10.09

Appendix XXII

MEAT INSPECTION FOR THE YEAR ENDED 31st DECEMBER, 1964

Number and Type of Animals Slaughtered		Carcases Condemned for—									Part Carcases Condemned for—						Organs Condemned for—					
		Tuberculosis	Actinomycosis	Piroplasmosis	Caseous Lymphadenitis	Para-Typhoid	Traumatic and Septic Conditions	Pleuro-Pneumonia	Other Abnormalities	Total Carcases Condemned	Actinomycosis	Caseous Lymphadenitis	Tuberculosis	Arthritis	Other Abnormalities	Total Part Carcases Condemned	Actinomycosis	Echinococcosis	Pleuro-Pneumonia	Tuberculosis	Other Abnormalities	Total Organs Condemned
Robb's Jetty (including Watson's and Anchorage Butchers)																						
Cattle	22,293	21	....	1	....	....	95	....	19	136	102	....	....	....	57	159	294	99	....	8	1,432	1,833
Calves	232	....	....	....	....	....	....	....	4	4	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	233,637	....	....	....	18	....	174	....	366	558	....	489	....	409	6	904	....	225	....	....	18,068	18,293
Pigs	85,757	73	....	....	....	85	119	....	163	440	....	....	1,042	266	866	2,174	....	....	....	45	67,309	67,354
Midland Junction (including Foggit Jones)																						
Cattle	57,320	53	....	....	....	....	90	....	135	278	658	....	25	6	66	755	20	275	....	50	1,802	2,147
Calves	6,696	4	....	....	....	....	2	....	7	13	....	....	....	....	1	1	....	....	....	....	6	6
Sheep	526,348	....	....	....	94	....	170	....	2,108	2,372	....	410	....	542	67	1,019	....	....	....	....	44,913	44,913
Pigs	44,462	14	....	....	....	12	25	....	72	123	....	....	155	195	125	475	....	....	....	1	6,259	6,260
Kalgoorlie																						
Cattle	2,069	....	....	....	....	....	....	....	....	....	11	....	1	....	5	17	....	....	....	....	45	45
Calves	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	31,630	....	....	....	1	....	3	....	66	70	1	44	....	20	38	103	....	11	....	....	1,639	1,650
Pigs	2,149	....	....	....	....	....	....	....	1	1	....	....	11	1	9	21	....	....	....	1	124	125
Perth Meat Markets																						
Cattle	1,116	....	....	....	....	....	6	....	14	20	....	....	....	....	....	....	....	....	....	....	61	61
Calves	9,428	....	....	....	....	....	1	....	62	63	....	....	....	....	....	....	....	....	....	....	25	25
Sheep	400	....	....	....	....	....	....	....	19	19	....	....	....	....	....	....	....	....	....	....	8	8
Pigs	275	2	....	....	....	5	....	....	1	8	....	....	....	....	....	....	....	12	....	....	9	21
Fremantle Meat Markets																						
Cattle	65	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Calves	1,352	....	....	....	....	....	....	....	14	14	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	7	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....
Pigs	55	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
** Country Districts*																						
Cattle	45,620	34	....	....	....	....	41	....	39	114	102	54	31	12	194	393	84	259	....	15	721	1,079
Calves	15,830	....	....	....	....	....	21	....	179	200	....	....	....	....	19	19	....	....	....	....	29	29
Sheep	236,239	....	....	....	35	....	235	....	517	787	....	183	....	335	87	605	....	674	....	....	9,891	10,565
Pigs	15,682	20	....	....	....	22	19	....	24	85	....	1	147	96	44	288	....	47	....	30	1,884	1,961

Totals—	
Cattle	128,483
Calves	33,541
Sheep	1,028,261
Pigs	148,380
	1,338,665

* Country Districts included :—Albany, Busselton, Bunbury, Collie, Donnybrook, Esperance, Geraldton, Harvey, Katanning, Merredin Mandurah, Manjimup, Narrogin, Northam, Plantagenet, Upper Blackwood, Wagin, Waroona York.

Appendix XXIII

REVENUE AND EXPENDITURE FOR THE YEAR, 1964.

REVENUE

	£
Derby Leprosarium—	
Maintenance Fees	27,224
Hospitals, Pens. Medical and Pharmaceutical Benefits	10,839
Other Revenue	336
Anatomy Licenses	36
Baby Patterns	....
Building Inspection Fees	2,425
Examination Septic Tank Plans	20,102
Fish Branding Fees	1,055
North-West Health Inspectors Scheme (Kimberley)	407
Health Laboratories—	
Water Sampling Fees	4,000
Fees :	
Albany	3,669
Bunbury	9,397
Derby	2,925
Geraldton	1,836
Manjimup	2,900
Narrogin	2,868
Northam	2,446
Wooroloo	1,073
Port Hedland	250
Maternity Home Licenses and Private Hospital Licenses	753
Meat Branding Fees	17,933
Nurses Registration and Examination Fees	3,105
Other (including Pest Control)	1,179
Pathological Fees (Public)—Central Laboratories	9,174
Pathological Fees—Commonwealth Recoups	5,725
Perth M.O. Fees	1,974
Pesticide Registration Fees	310
Polio Refunds (1956/57)	138
Polio After Care	....
Radio Active Substances Act	95
Sanitary Fixtures and Fittings Fees	74
Sanitation—Other	5
Tuberculosis—Laboratory Unit Costs—Chest Clinic	12,937
Non Tuberculosis—Laboratory Unit Costs—Sir Charles Gairdner Hospital	36,512
Tuberculosis—Laboratory Unit Costs—Sir Charles Gairdner Hospital	19,640
Wooroloo Isolation Hospital Benefits—Lepers	....
Derby Dentists Fees	1,156
Port Hedland Dentist Fees	1,564
Tuberculosis Diagnosis—	
Commonwealth Capital Recoups	16,275
Commonwealth Maintenance Recoups	368.814
Bore Hole Toilet Fees	4
Photographic Charges	294
Wooroloo Isolation Pensioners Benefits—Lepers	....
Laboratories—	
Recoups from Mental Health Service	1,563
Autopsies	70
Total	£593,082

EXPENDITURE

	£
Salaries (including Tuberculosis)	571,277
School Medical Doctors and Nurses Travelling	4,910
Dental Bursaries	8,498
School Dentists Travelling and Expenses	8,611
School Medical and Dental Services—Other Expenditure	22,864
Travelling and Transport Generally	5,146
Travelling and Transport Commissioner and Medical Officer	656
Opthalmic Survey	4,789
Postage and Telephones	5,260
Laboratories	78,839
Venereal Diseases	3,546
Infant Welfare Centre (including salaries)	140,058
Maintenance and Transport—Lepers	44,145
Poliomyelitis	20,904
Sanitation—Government Buildings	10,495
Tuberculosis Clinics	375,318
Miscellaneous	27,057
Total	£1,332,373

By Authority. ALEX. B. DAVIES, Government Printer